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ABSTRACT

Part I of this document describes a model for occupational program planning in two-year colleges. The planning process begins with an estimation decision, i.e., whether the program idea is worth investigating. This decision can be divided into seven sub-questions or systems: (1) Identity--what should be the general content of the program? (2) Articulation--does the program fit college, local, regional, and state plans? (3) Resources--does the college have the resources to conduct the program? (4) Students--how many and what kinds of students will the program attract? (5) Employment--will graduates be able to obtain jobs commensurate with their training? (6) Support--will the program be supported within the college and community? (7) Evaluation--how will the program be evaluated? The second stage of the planning process is the precision phase, when the decision whether to implement the program is made. This phase requires a more rigorous investigation of the proposed program and involves four steps: strategy, detailed investigation of the seven subsystems, assessment and decision, and, when necessary, the preparation of a final program proposal. Part II of this document outlines the historical and theoretical context of the system, and Part III presents a simulation of the system at work. (NHM)

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PROGRAM PLANNING IN 2 YR COLLEGES: A HANDBOOK

Department of Education, New York State College of Agriculture and Life Sciences
a Statutory College of the State University at Cornell University, Ithaca, New York

JC 750 492

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Program Planning in Two-Year Colleges:

A Handbook

by

George Posner, Assistant Professor
Joan Roos Egner, Associate Professor
Dalva Hedlund, Associate Professor
Robert Young, Research Associate
Lorraine Chickering-Clay, Research Assistant
Ardeth Deay, Research Assistant
Kay Koffel, Research Assistant

In Cooperation with the
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in Occupational Education

Department of Education
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
at Cornell University

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INTRODUCTION

> It took man roughly 475,000 years to arrive at the Agricultural Revolution. It required another 25,000 years to come to the Industrial Revolution. We have arrived at the "Space Age" in a hundred and fifty years--and while we do not know where we go from here, we can be sure that we shall go there fast (6).

A decade has passed since Charles Frankel made that statement. The events of the last ten years verify his prediction that unforeseen and rapid change would be a fact of American life.

In the last ten years, Americans have been to the moon several times. Vietnam has exploded and ebbed in importance. "Student activists" have come and gone; so have "hippies" and "yippies" and "black panthers" and "weathermen." The political confidence of the "new frontier" has given way to the political uncertainty of the 70's. The fuel-burning Cadillac has become a symbol of the worst, as well as the best, of American affluence. Civil Rights has spawned new movements for peace, ecology, women's rights, and other groups and causes.

Labor in America has not been immune to change. Many years have passed since this was a rural, agricultural nation. Even industrial America is changing. Today, the American labor force produces more services than material goods. Its unskilled workers are forced to become skilled in such areas as abstract thinking or be replaced by automation. The primary requirement for employment is changing from physical power to mental agility.

These changes increase the role of education in the careers of American workers. Havighurst (8) asserts that the right to work is tied to the acquisition of education. Bebout (2) states that education helps workers adapt to automation, therefore, formal education is a prerequisite for decent living in society.

For at least two reasons, two-year colleges, and in particular, community colleges, play a major role in the education of American workers. First, two-year community colleges are the most accessible institutions of higher education in the nation. Geographically, financially, and academically, community colleges make their education accessible to Americans. Second, the changes in the labor force require education beyond high school but, for most jobs, below the baccalaureate level. About half of the labor force is employed in semi-professional and technical jobs; two-year colleges want to educate this middle "fifty percent" of American manpower (7).

The two-year college has been involved in occupational education for many years. This involvement began with the signing of the Smith-Hughes Act in the 1920's. The Depression increased the need for two-year college occupational programs. After World War II, the two-year college expanded dramatically. Among the reasons for its expansion were the emergence of new fields of technology and the vocational-educational needs of returning military personnel (10).

Two-year college education has continued to expand. During the 1960's, new two-year colleges opened at the approximate rate of one per week (4). Student numbers doubled between 1964 and 1969; by 1969 half of the beginning college students in the United States were enrolled in two-year colleges (1).

Two-year college occupational programs have been affected by the changes in society and its work force. Cohen (5) claims that two-year occupational programs are unstable because they reflect rapid technological and sociological changes. He describes a shift from drafting, machine tooling, automotive and agriculture programs to "space age" programs such as electronics and computer technology. Today, some "space age" technology programs lose enrollment to service programs such as nursing and law enforcement. Even some service programs are losing students because they do not reflect current needs in the job market. As the job market shifts, so does the enrollment in two-year college occupational programs.

These shifts create important problems for two-year college educators. The problems are philosophical: what education enables students to be effectively employed in a world of change? They are also pragmatic: technical and vocational education programs cost more than liberal arts programs if the necessary equipment and personnel are secured (3). If an occupational program fails to attract students, then the monetary impact can devastate a college.

The problems are not discrete. The pragmatic affects the philosophical. The failure of a program can prevent a college from achieving its total goals. This problem of program failure is especially likely in today's political climate. The public often cares more about the efficient use of its tax dollars than it cares about the abstract educational concerns of two-year colleges.

The well of tax dollars has dried up. During the 1960's college educators became spoiled by the easy availability of public money. The 1970's have been different. Tax levies have failed and budgets have been cut. Educators have been forced to show what is needed, where it is needed, and why it is needed to a tax-weary public. The public has demanded maximum efficiency and economy for the use of its scarce resources (9). Many two-year college educators have had to fight to maintain existing programs. It is double the effort for them to establish new and expensive occupational programs.

What should they do? When should they commit college resources to a new occupational program? When should they choose not to risk those resources? What information do they need to know?

A project to answer these questions has been funded by the New York State Education Department through the New York State College of Agriculture and Life Sciences at Cornell University. The project has developed, evaluated and disseminated a system for occupational program planning in two-year colleges. The first year of the project was devoted to the development of the System; the second has been directed to the evaluation and dissemination of the System.

The goal of the project has been to help two-year college educators investigate an occupational program thoroughly and systematically before they decide its fate. The educators need to know particular information at particular times in order to make appropriate decisions about an occupational program. A system should help them make those decisions.

The watchword of the project has been "usability". The System must be usable by two-year colleges. The project will fail if the System is never used by the colleges. The System must find a home on the desks, not the shelves, of two-year college educators.

The usability of the System was increased by the involvement of two-year colleges throughout the project. Deans from six community colleges -- Broome, Corning, Finger Lakes, Jefferson, Monroe and Tompkins-Cortland -- helped develop the System during the first phase of the project. The System was used at three community colleges -- Corning, Genesee, and Monroe during the second phase. Finally, it was disseminated to educators at sixteen two-year colleges through on-campus and regional workshops in New York State.

The usability of the System was tested in a variety of ways at the three community colleges. At Corning, a program development analyst examined the establishment of a dental hygiene program. The analyst, a dental hygienist, had no experience in program planning. Thus, she used the System first as an aid to understanding the process and parameters of program planning. Then she investigated the feasibility of a dental hygiene program at the college. Her final recommendation, not to establish the program, was based on a low demand-moderate supply employment market for hygienists.

At Genesee, the System was used by an ad hoc curriculum committee in their attempt to standardize criteria for curriculum review. Committee members and division chairmen used the System to understand the college-wide concerns of program planning at Genesee. The committee differentiated areas of all-college concern, in which they could ask questions of substance (e.g. "how do the goals of this program relate to the mission of the college?"), from other concerns, in which they could only ask questions about research procedure (e.g. "how did you arrive at the estimate of jobs in the field?").

At Monroe, the Dean of Curriculum and two faculty members thoroughly examined the System for help in the planning of two programs. The System was used to narrow the parameters of one program -- from an experimental, costly and vague design to a more feasible design for implementation. Planners of the second program used the System as a guide in their field research of similar, existing programs. The planners asked administrators of those programs selected questions from the System.

Finally, the System was disseminated to sixteen colleges through on-campus and regional workshops. Faculty and administrators from Monroe, Jefferson, Corning, Mohawk Valley, Genessee, Cobleskill, Herkimer, Jamestown and Erie learned about the System through on-campus meetings. Faculty and administrators from Sullivan, Delhi, Dutchess, Rockland, Borough of Manhattan, Suffolk and New York City learned about the System at a regional workshop in Spring Valley. In addition, administrators at three more colleges -- Tompkins-Cortland, Broome and Finger Lakes -- learned about the System through their work on the advisory committee of the project. In addition, an article about the project and the System was accepted for Fall 1975 publication in the Community College Review, a national journal for two-year college educators. The article is titled: "Occupational Program Planning: A Systematic Approach."

This document is the final product of the project. It advances the work in an earlier publication, A Decision System For Occupational Programs in Community Colleges. This document, like the earlier publication, is divided into three parts. Part one is color-coded in yellow; it contains the project System. This section of the document should be most useful to the two-year college program planner. In part two, materials and concepts are reviewed that have been important in the development of the System. First, the literature on occupational program planning in two-year colleges is explored. Then, the reader is informed of important concepts in the development of the System. Both of these reviews can serve as resources for the researcher of occupational program systems. Part three is also color-coded in yellow. It contains a simulation that can be used by the program planner. The simulation introduces many of the sources and kinds of information program planners can use.

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PART ONE: THE PROGRAM PLANNING SYSTEM

INTRODUCTION TO A NEW SYSTEM

In the last thirty years, many words have been written about occupational program planning in two-year colleges. Unfortunately, the abundance of words has not been matched by improvements in the development process. The process is essentially the same today as it was in the 1940's: Someone gets an idea for a program. He or she meets with representatives of local business. They discuss the needs of business and plan a program to meet those needs. The representatives of business become an advisory committee. A survey is conducted. Ultimately a program proposal emerges for approval by the college and the state.

This process of program planning has been historically important to two-year colleges. It has encouraged communication between the college and the community. It has created programs that fit the needs of students and the community. Thus, this process has helped fulfill the promise of the "community" college.

But the historical process does not meet the needs of modern two-year colleges. It lacks comprehensiveness and order. There are many important questions which arise in the process of planning a program: Does the program fit the philosophy of the college? Will it be supported by the staff? Does this program overlap the programs of local and regional agencies? The historical process may enable all the relevant questions to be asked, but there is no guarantee that these questions will emerge. If they do emerge, they may emerge haphazardly. A question on students might be asked here, a question on employment there. The questions, and thus their accompanying answers, emerge in no systematic order.

Many of the recent attempts to systematize the program planning process have not been very helpful (see Part Two for examples of such systems). These systems have been written at an abstract level. They have not systematized the reality of occupational program planning -- the real questions, the conflicting priorities, the tough decisions. The systems have been largely theoretical and generally unusable by two-year college educators.

A good system for program planning must overcome both the haphazardness of the traditional decision process and the abstractness of the new "systems." It must be based in the reality of two-year colleges but it must try to order that reality in logical ways. A good system blends reality and theory for the improvement of the planning process. In the program planning System developed in this project, theory delineates the procedural framework and reality provides the content.

The System covers two decisions which are required by the State University of New York (SUNY) before a program is approved. The first, an estimation decision, is whether or not the program should be investigated. A positive decision results in a commitment to investigate program feasibility. In New York State this commitment is indicated by a Letter of Intent to SUNY. The second decision, a precision decision, is whether or not the program should be adopted. A positive decision culminates in a formal program proposal.

The State University of New York has also specified that academic program proposals include six categories of information or decision areas: identity, articulation, resources, students, support, and evaluation. The System from this project includes these six categories and a seventh, employment, which is a direct concern in occupational program planning.

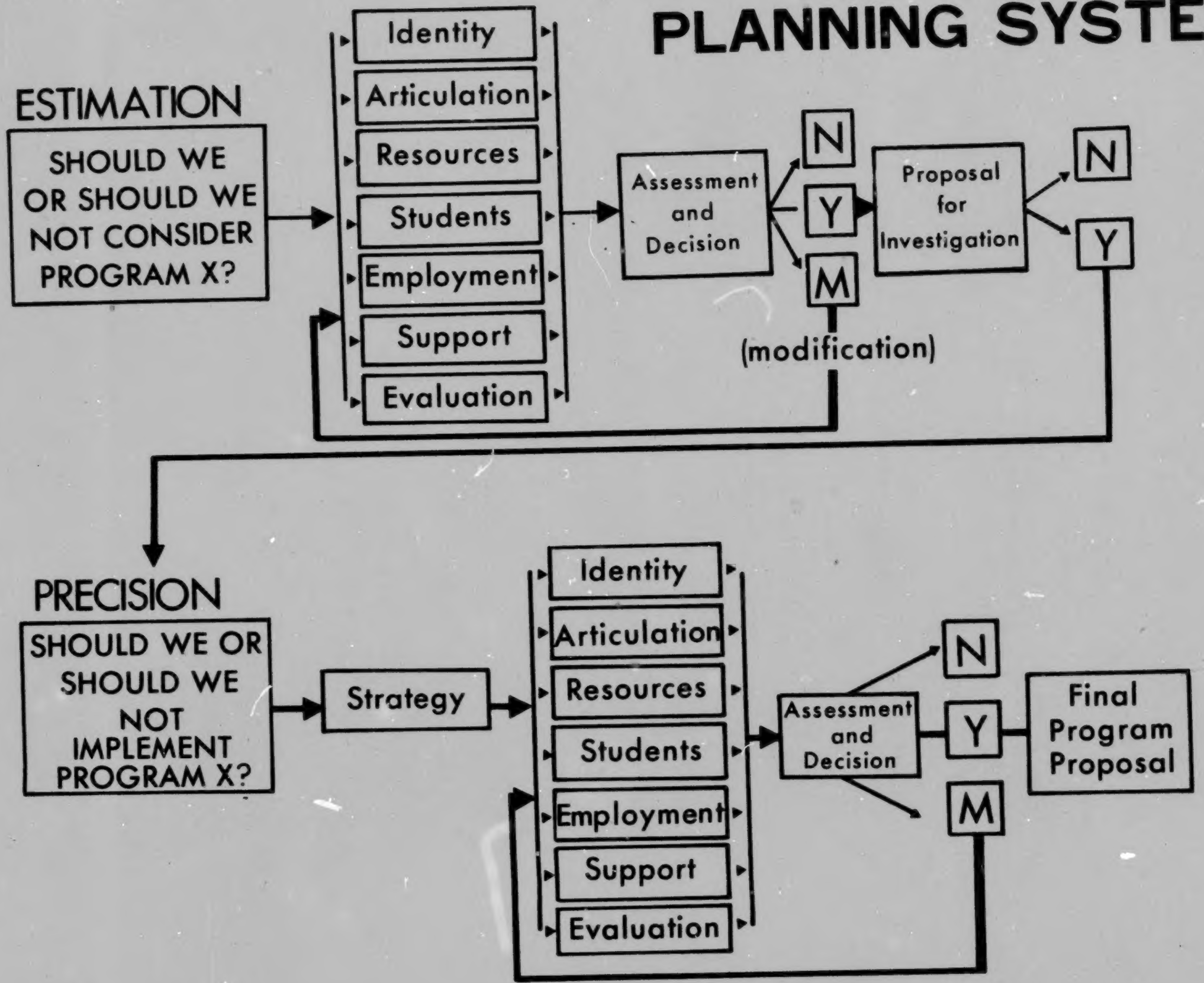
The primary purpose of the System is to help two-year college educators plan occupational programs. Another use of the System is to analyze successful programs at other two-year colleges. The System can help the educator understand the operation of a successful program of the type in which he is interested. Other purposes and uses of the System might occur to the reader. The System could serve as an in-service education device for faculty. Curriculum committees could use it as a basis of their discussions. College staff could analyze existing programs through the System. The potential uses of the System are many and varied.

The chart on page 15 is the schematic representation of the System. The estimation and precision decisions are displayed. Displayed within each of these decisions are subordinate areas of concern. Each area contains a set of questions which needs to be considered in arriving at a program decision. In this System, each set of questions which comprises a subordinate area is termed a subsystem, e.g., Identity subsystem.

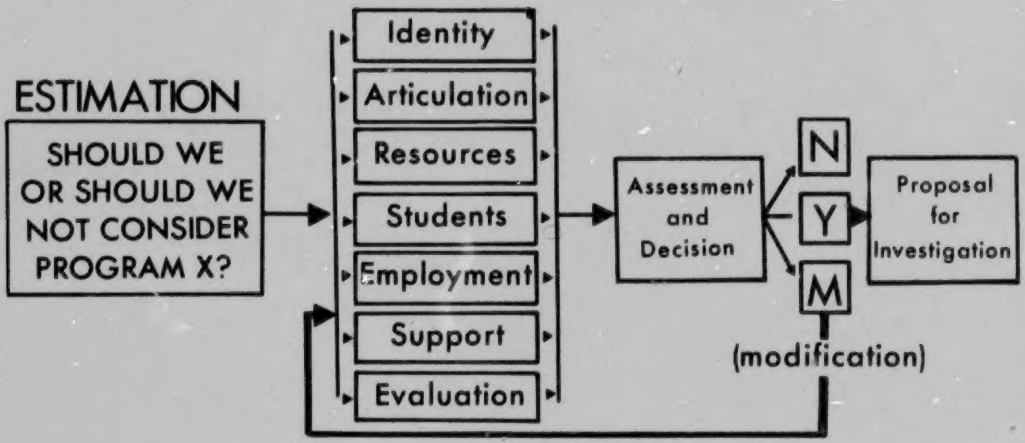
The precision decision includes the establishment of criteria, the gathering of facts, and the formation of judgments in each of the decision areas or subsystems. The judgments are summarized for the final decision concerning the adoption of the program.

The reader should note that the subsystems are placed in a general, not mandatory order of priority. Arrows do not fix the connections between the subsystems. This arrangement is intended to provide the program initiator with a comprehensive yet flexible system. The System enables an initiator from college A to gather employment information first. The initiator from college B may desire resources information first. The priorities of institutions differ and this system recognizes and respects those differences.

PROGRAM PLANNING SYSTEM



ESTIMATION PHASE*



The planning process begins when the planner is faced with a basic question: Is the program idea worth investigating? An affirmative answer to this question leads to a proposal for further investigation (a Letter of Intent to the State University of New York).

The question of whether a program is worth investigating can be divided into sub-questions to guide the estimation research of the planner. These sub-questions are listed on the next page. Answers to the sub-questions are obtainable with a minimum expenditure of effort. Often, the answers result from the experience and personal contacts of the planner. Negative answers to the questions lead either to the modification or abandonment of the program idea. Positive answers lead to the decision to thoroughly investigate whether or not the program should be implemented. This subsequent investigation comprises the precision phase of the System.

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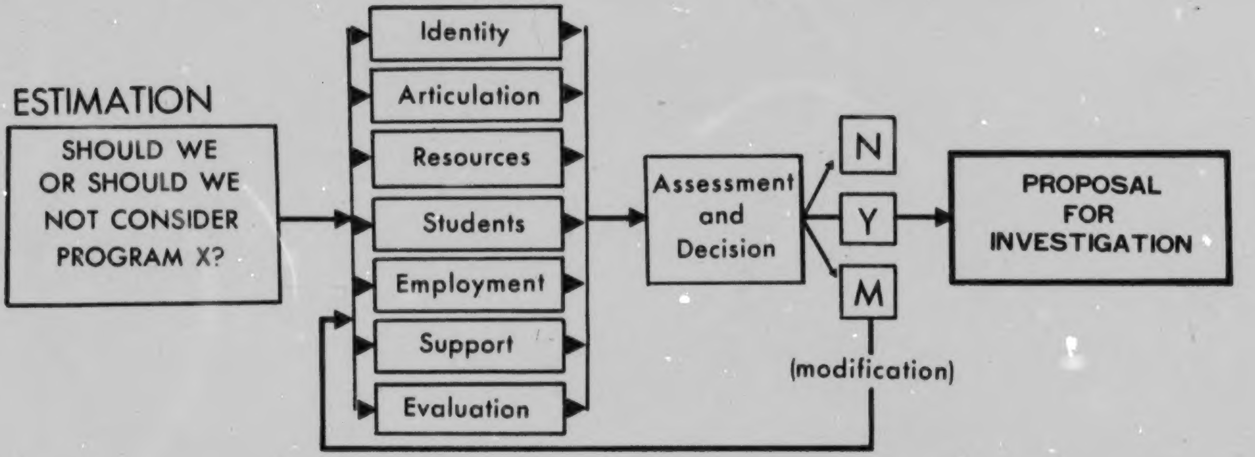
*Although the following discussion is written in the context of SUNY's procedure, the general framework is applicable to other program planning situations.

QUESTIONS

Identity	100*	What should be the general content of the program?
Articulation	200	Does the program fit college, local, regional and state plans?
Resources	300	Does the college have the resources to conduct the program?
Students	400	How many and what kinds of students will the program attract?
Employment	500	Will the graduates of the program be able to obtain jobs commensurate with their training?
Support	600	Will the program be supported within the college and the community?
Evaluation	700	How will the program be evaluated?

*This numbering system is explained on pages 21-23.

PROPOSAL FOR INVESTIGATION



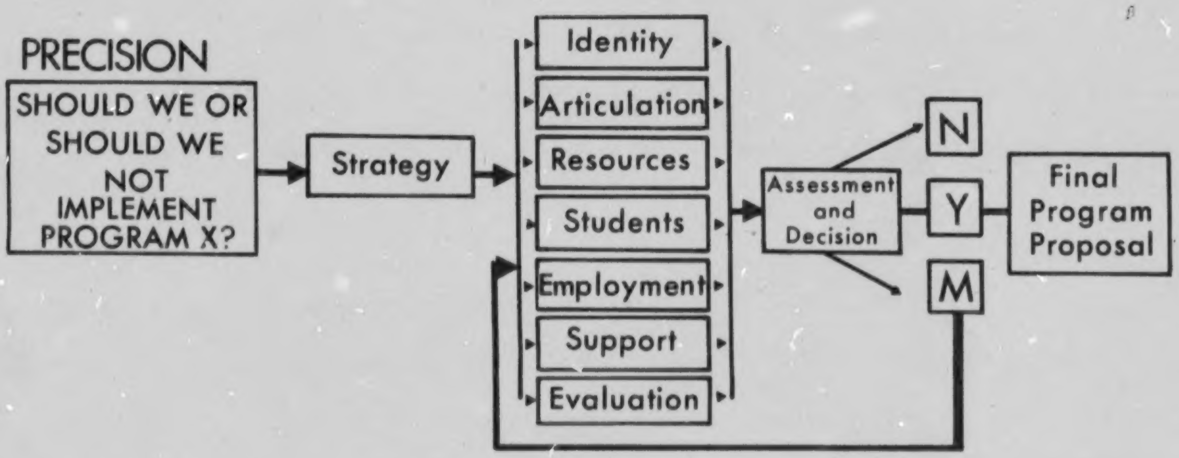
Once the planner has decided that the program is worth further investigation, approval by college or state authorities is often required. Within the State University of New York (SUNY), this approval must come from the Vice-Chancellor for Academic Programs on the basis of a Letter of Intent from the president of the college. State University approval of the Letter does not indicate approval of the program itself. Rather, at this time, the State University approves or disapproves the investigation of the program. Therefore, the information required in the Letter of Intent is much less exhaustive than that required in the program proposal.

Currently, the concerns of SUNY seem to center on two of the estimation questions: Identity and Articulation. The State University needs information about the following aspects of the program's Identity: the title of the program; its general content; and the area, level and type of occupation for which students will be prepared. In Articulation, the

State is primarily concerned about the relationship of the new program to existing programs at the college and at other colleges within the region. Preliminary answers to other estimation questions -- Students, Resources, Employment, Support -- can also be included in the Letter. However, such information should be limited, in keeping with the purpose of the Letter of Intent.

If the response to the Letter of Intent is negative, two courses of action are open to the college. The program may be abandoned or it may be revised and a new Letter of Intent submitted. If the Letter of Intent eventually elicits a positive response from SUNY, the program planner initiates the precision phase of research.

PRECISION PHASE



The precision phase of the planning process requires a more rigorous investigation of the proposed program. The outcome of the precision phase will be one of the following: (1) a complete program proposal, including a detailed program description and all supporting information; or (2) a decision to modify some aspect of the proposed program to make it more acceptable; or (3) a decision that some aspects of the proposed program are unacceptable, therefore, the program will not be considered further.

The precision phase contains four steps: strategy, subsystem investigation, assessment and decision, and, when necessary, the preparation of a final program proposal. These steps are described in detail in the following pages. The remainder of this introduction is devoted to a description of the interactive aspects of the System: the interaction of the precision and estimation phases and the interaction of questions within the precision phase. In order to explicate these interactions, it is also necessary to describe the numbering system used throughout this handbook.

Interactions

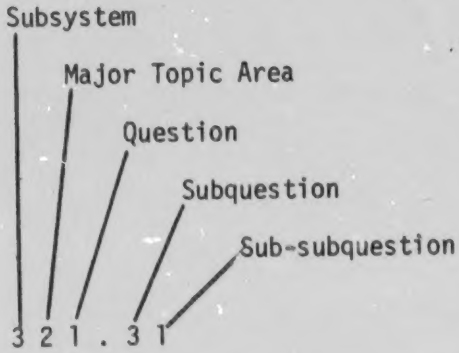
The chart on page 15 displays two discrete phases of investigation: estimation and precision. Despite its crisp distinctions, the chart does not describe what goes on during the real investigation of these two phases. Estimation research often provides a great deal of information for the precision phase. Some planners will not submit a Letter of Intent unless they have full, precision-type information to answer one or more of the estimation questions. Such planners may find it profitable to study immediately the questions and discussions in appropriate precision subsystems. However, those who have done extensive subsystem research in the estimation phase will find it useful to run through those subsystems again during the precision phase. Those planners will gain a deeper understanding of the interrelatedness or interactions of all the subsystems.

A second form of interaction concerns the questions within the precision phase. Program planning is not a linear process. The answers to some questions in each subsystem will affect the answers to questions in other subsystems and the resulting judgments made concerning the program and its feasibility.

Numbering

In order to facilitate the comparison of information among and within subsystems, a numbering system has been utilized. Each of the seven subsystems is indicated by a number from 1-7 in the hundreds column. Within each subsystem (e.g., Identity, 100) major topic areas (e.g., Philosophy and Goals, Curriculum, and Instructional Plan) are labelled by multiples of ten (e.g., 110, 120 and 130, respectively). Each major topic number does not have a question opposite it. However, questions are listed beneath each topic area. Each question is labelled according to its subsystem, its topic within that subsystem, and its particular location within that topic. In addition, some questions are divided into subquestions, indicated by a decimal point. If it is necessary to divide these subquestions even further, a second decimal place is used (e.g., 321.31).

The following chart summarizes the numbering system:



When a given question is related to any other question, the interaction is noted by italicized numbers after the focal question. If a major topic area is related to other topics or questions in the System, italicized numbers appear opposite the topic heading. For example:

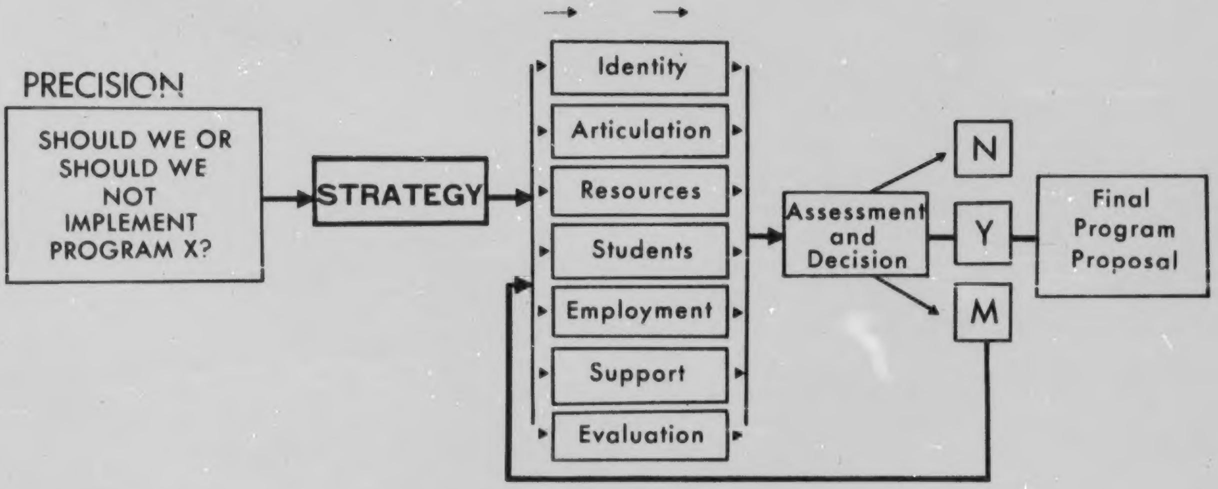
Topic	Topic Number	Interacting Topic	Interacting Question
Curriculum	120	*450*	*322*

If most of the questions and subquestions of a different topic area interact with a given question, only the major topic number appears after the focal question. For example:

Special Student Considerations	450	*321.31.33,321.35,322,331.5*
Residence	451	Will the place of residence of enrolling students affect the program? *510*

This numbering system attempts to show the interaction among questions. The interactions reveal the need to work back and forth from subsystem to subsystem and from topic to topic within subsystems, because the answer to one question often influences the answer to many other questions.

STRATEGY



The program planner must detail a strategy for the management of the precision phase. The initial problem is whether to follow an "open-front" or a "solid-front" planning procedure. The open-front procedure has some virtues. Using this approach, parts of the proposed program -- perhaps a course or two, or a field work component -- would be implemented immediately. In short, open-front planning starts in a small way and grows with success. Evaluation is conducted at each step. At the point where a major commitment of resources is required, a considerable body of data is available to complete the precision phase. The open-front procedure requires an elongated time-frame to complete planning and it may not be appropriate for programs which must meet a set of external standards, such as certification. Also, open-front programs must be careful in the representation of their courses to students. Unsuspecting students might be caught in the middle of a program that does not become fully established.

Solid-front planning requires that all of the planning for the program be completed prior to the implementation of any part. Sometimes the parts of a solid-front program can be integrated better than those of an open-front program. The primary problem with solid-front planning is that the consequences of a planning mistake are more significant than in an open-front approach.

Once this initial commitment to planning has been made, the planner must assess the personnel and resources available for the precision phase of the research. He or she will also need to consider procedures for using the System and for approving the program.

It is essential for the planner to keep in mind which subsystems are most important to the proposed program or to the situation of the college. This information will determine the entry point(s) the planner will choose. Regardless of the entry point(s), precision phase research requires the investigation of all subsystems. Thus, entry point does not determine which subsystem the planner investigates, but, rather, the sequence of subsystem investigation.

It may be useful for the planner to think of the subsystem questions witnin a framework of criteria, fact-finding, and judgments. The planner must approach each subsystem with an idea of what his or her criteria for approval will be. He or she then proceeds through the subsystem gathering facts to answer the questions. The facts are compared to the established criteria. On the basis of this comparison, a judgment is made as to what degree the facts must match the criteria for the program.

The following questions are suggested to help the planner develop a strategy for management of the precision phase:

Type of Planning

1. Will the planning be "open front", e.g., will a pilot program be used before the total program is approved or rejected?
2. Will the planning be "solid front", e.g., will the decision to accept or reject the program be made before parts of the program are tested?

Personnel

1. Who will have primary responsibility for conducting and coordinating the research?
2. What role will institutional staff have in the research for each of the subsystems, e.g., faculty, director of institutional research, academic dean, curriculum committees, etc.?
3. Will new personnel be employed to do the research, e.g., through obtaining a grant for the research?
4. How will the implementers of the proposed program be involved in the planning for it?
5. What role will community groups, e.g., potential employers, have in the research for each of the subsystems?

Resources

1. What financial resources are available at the college for the research?
2. Will money be requested from outside agencies to sponsor the research?
3. Will the primary researcher and/or others be compensated for their efforts? How?
4. Will the primary researcher and/or others be released from other duties in order to do the research? How will those duties be fulfilled?

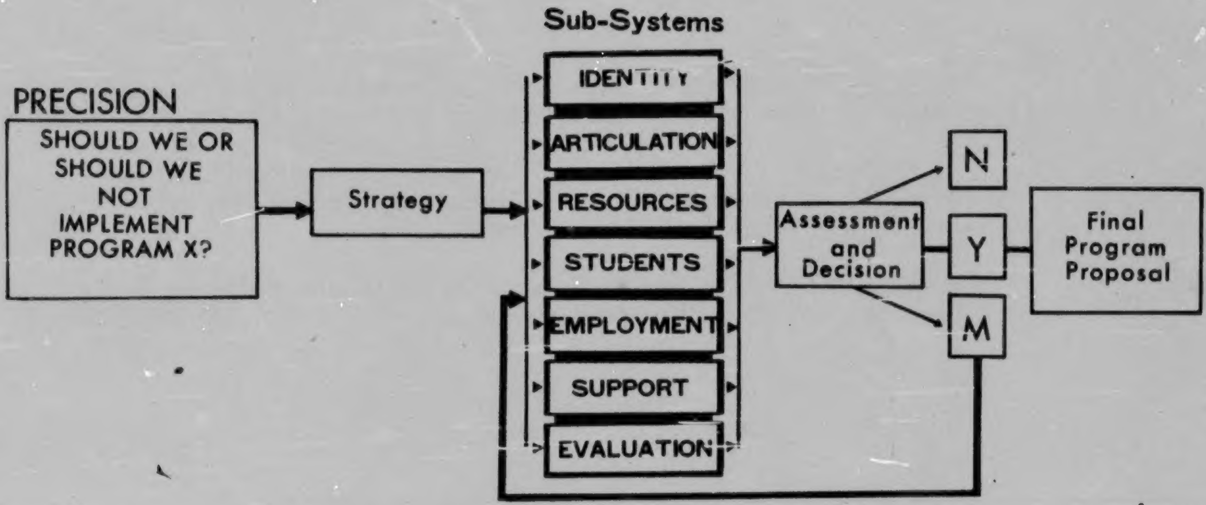
Procedures

1. What are the priorities of importance of the subsystems to the proposed program or to the situation of the college?
2. What are the deadlines for research information to be gathered in each of the subsystems?
3. What methods of data collection are to be considered for use in the research of the subsystems, e.g., observational devices, questionnaires, phone surveys?
4. How will information be shared when it is important to the development of more than one subsystem?

Approval

1. What personnel or groups will have the power to approve or reject the proposed program, e.g., curriculum committees, dean of instruction, president, faculty association?
2. At what points will each of these personnel or groups be involved in the approval process?
3. What concerns are most important to each of the personnel or groups, e.g., Identity to the curriculum committee?

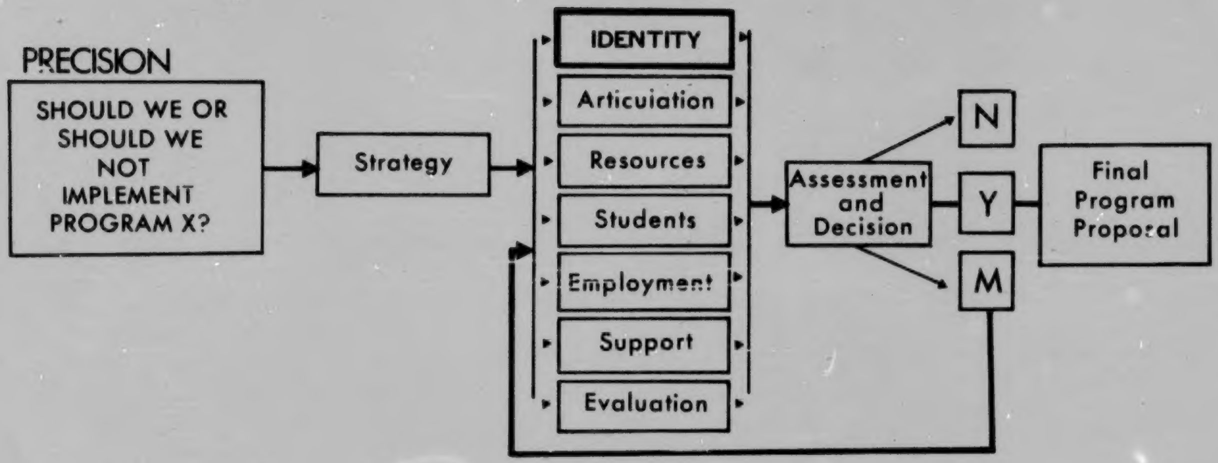
SUBSYSTEMS



Each of the subsystems is described in the following way:

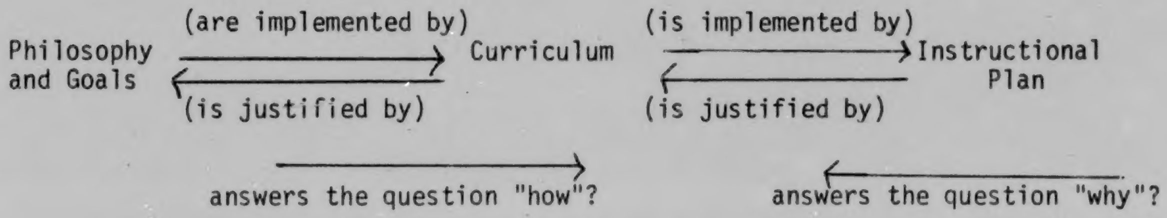
1. A chart depicts the part of the program planning System under discussion.
2. An introduction describes the subsystem.
3. The topics and questions of the subsystem are given.
4. A discussion section describes some techniques that might help the planner. References in the discussion are indicated in parentheses.
5. Selected references are listed.

100 IDENTITY



The Identity subsystem conceptualizes the proposed program. The major questions of the subsystem are: What are the goals of this program? How will the program fulfill its goals? To answer these questions, the subsystem is divided into three major topics: (1) the philosophy and goals of the program, that is, the rationale and aims of the program, (2) the curriculum, that is, what is to be taught and learned, and (3) the instructional plan or teaching strategies.

One may think of these three elements in a continuum as follows:



This continuum shows that each topic in this subsystem can be a means or an end to another topic. For example, the curriculum is both the means to implementing a program's philosophy and goals and, at the same time, the end to which the instructional plan is directed.

In working through the questions that comprise Identity, the general rule is to deal with each topic in order. That is, some consideration of philosophy and goals should precede curriculum decisions, which in turn, should precede decision regarding the instructional plan. Further guidelines for using this subsystem are elaborated in the discussion section.

Philosophy and Goals	110	
Purposes	111	What are the major purposes of the program? *521*
Personal/social needs of students	111.1	What personal/social needs of the students should the program meet?
Community needs	111.2	What manpower or human service needs of the community should the program meet? *510, 520*
Career development needs of students	111.3	What career development needs of the students should the program meet? *450*
Occupational goals	112	For what occupational tasks should training be provided? *221,512*
General education goals	113	What general education goals should be met by the program? *221* What personal, social, or occupational goals of the student should be met by general education?
Professional goals	114	What are the professional goals of the program? *221,510*
Accreditation and licensure	114.1	Should the program meet accreditation or licensure criteria of any institution or organization?

Certification	114.2	Should the graduates of the program be prepared to pass certification tests? 512
Entry tests	114.3	Should the graduates of the program be prepared to pass entry tests for any occupations?
Advanced Degrees	114.4	Should the graduates of the program be prepared to enter other institutions which offer more advanced degrees? 213.1
Curriculum	120	
Expectations for entering students	121	450
Knowledge	121.1	What areas of knowledge are entering students anticipated to know?
Competencies	121.2	What competencies are entering students expected to have?
Attitudes and values	121.3	What attitudes and values are entering students expected to have?
Intended Learning Outcomes	122	What are the intended learning outcomes of the program?
Knowledge	122.1	What are the major areas of knowledge that need to be taught in the program?
Competencies	122.2	What are the major types of competencies that need to be acquired in the program?
Attitudes and values	122.3	What attitudes and values need to be fostered in the program?
Courses	123	What courses will comprise the program? 450
Requirements	123.1	What specific courses will be required?
Electives	123.2	What electives might complement the occupational goals of the program? What electives might meet the personal or social needs of the students?

Remedial work	123.3	If students entering the program do not have the expected knowledge, skills or attitudes, will remedial work, tutoring, and/or academic counseling be available? *452,453,455,456*
Instructional Plan	130	*311,314,321.2,322,430,450,624*
General teaching strategies	131	
For knowledge	131.1	What teaching strategies will be used to cover the major areas of knowledge?
For competencies	131.2	What teaching strategies will be used to develop competencies in occupational tasks? (Such strategies might include field experience, laboratory work or cooperative education.)
For attitudes and values	131.3	What teaching strategies will be used to instill or develop the desirable attitudes and values?
Special teaching strategies	132	Will any special teaching strategies be used in the program?
Internships and labwork	132.1	Does the program include internships, extensive laboratory work, or field experience?
Cooperative education	132.2	Does the program include cooperative education or work study experience?
Modular curriculum	132.3	Will the curriculum be written in modular form? Will the teaching strategy include modular scheduling?

Discussion

Identity is a crucial subsystem and work on Identity will often precede work on the other subsystems. However, the Identity of a program is extremely difficult to specify with any degree of finality until the other subsystems have been worked through. This dilemma for planners can be resolved by adopting a flexible approach to the System. This flexible approach entails the following rough approximation of an operating procedure:

1) Translate the answer to the estimation phase Identity question into a working title for the program. A useful procedure is to generate two or three possible titles reflecting two or three directions in which the program might go. The Identity subsystem can then be used to choose one of these titles or to abandon all of these titles in favor of one not yet considered. The titles serve as a starting point and as a focus for the rest of the subsystem.

2) Jot down the general rationale for each program being considered by answering (in rough form) questions 111, 112, and 113 in conjunction with question 221 of the Articulation subsystem. These questions can be best answered by consulting mission statements for the particular two-year college and for the state system of which the college is a part.

3) Now some work in the Employment subsystem should enable the planner to choose from among the alternative program titles. That is, there should be an attempt to test out the appropriateness of each alternative program in terms of employment opportunities for graduates. Steps two and three together should enable the planner to sharpen his or her focus on the basis of both the ideals expressed in mission statements and the realities of the job market.

4) Answers to questions 122.1, 122.2 and 122.3 can now be approximated with the help of an advisory committee. This same committee can also suggest or react to suggestions on appropriate courses (i.e., the packaging of intended learnings) and teaching strategies for those intended learnings (e.g., Is an internship both appropriate and feasible for accomplishing the objectives of the program?).

5) At this point the planner should shift his or her attention to the Students subsystem in order to answer question 121 and 122.3. The planner may also wish to amend his or her answers to questions 123 (courses) and 130 (teaching strategies) after working through the Stude[illegible]bsystem.

6) Now t[illegible]er must focus on the Resources subsystem in order to determine the feasibility of the program. He or she must reexamine the Employment subsystem in order to more fully answer questions 111.2, 111.3 and 112 in addition to addressing question 114 for the first time.

By following the above six steps, the planner should have decided which of the alternatives is most viable and at the same time arrived at a first approximation of the program's Identity.

Although the Identity questions proceed in some semblance of a "logical" order (as does the System as a whole), the planner needs to work back and forth from question to question and from subsystem to subsystem. This does not reflect a weakness in the System but, instead, the complexity of the planning process.

If the program planner begins the Identity research at a high-numbered question, then he or she will probably not consider the full range of options available in the subsystem. For example, if the planner starts with the assumption that lectures (or internships or any other teaching stragegy) will be the primary mode of instruction, he is more limited than he would have been had he first asked "what do I want students to learn?" and then asked "how might they best learn it?"

Another thing to keep in mind is that although a given philosophy and set of goals may limit one's choice of curriculum, and that a given curriculum may limit (and, therefore, guide) one's choice of instructional plans, in each case one still has a choice to make. That is, one cannot logically derive curriculum from philosophy and goals or instructional plan from curriculum. Therefore, obviously, other factors must be brought to bear on each of these decisions. These factors primarily consist of considerations regarding employment, students and resources. It is this observation that has led to the flexible and reciprical kind of technique outlined above. In a sense, Identity is both the starting point and the finishing point of the System as a whole.

References

1. Bloom, B. S. et. al. (eds.). Taxonomy of Educational Objectives. Handbook I: Cognitive Domain. (New York: David McKay, 1956).

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3. Johnson, M. "Definitions and Models in Curriculum Theory," 17 (April 1967): 127-40.

4. Joyce, B. and Weil, J. Models of Teaching. (Englewood Cliffs, N. J.: Prentice-Hall, 1972).

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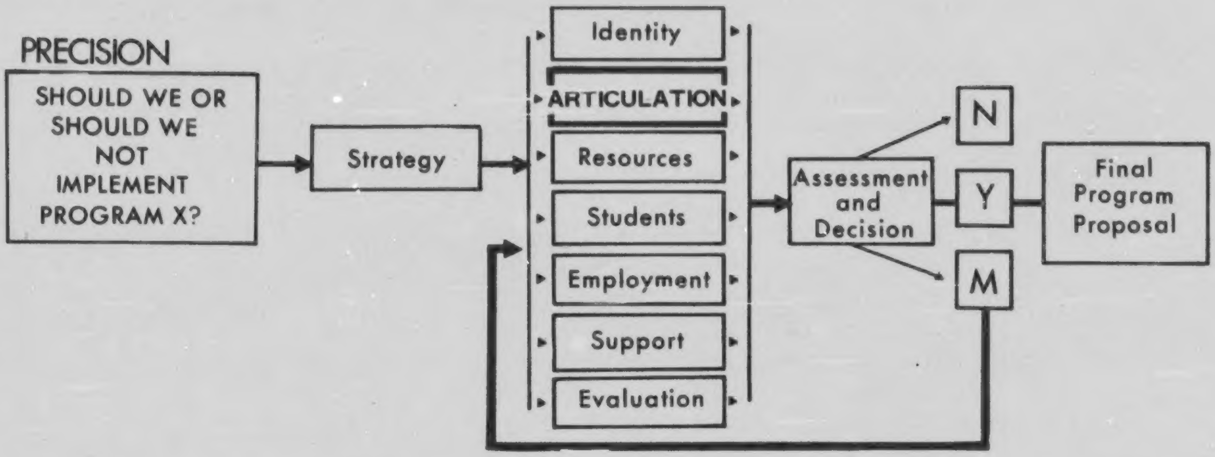
200 ARTICULATION



The Articulation subsystem seeks to determine the congruence of the proposed program with programs and plans that exist outside and inside the college. The programs and plans of state, regional and local agencies are considered; so are the goals and programs of the college.

Given situations will dictate the order in which the Articulation questions are answered. There is no recommended order to answering the questions.

External planning considerations	210	
State level	211	Is the program congruent with the SUNY Master Plan?
Regional level	212	Is the program congruent with plans and programs of other institutions in the area? *112, 113, 114, 530*
Regional Planning Councils	212.1	Is the program in accordance with any Regional Councils' considerations? (such councils might include the Occupational Planning Council, or the Appalachian Regional Council)

BOCES	212.2	Does the program complement or conflict with BOCES programs and plans?
Other institutions in the area	212.3	Does the program complement or conflict with programs at private colleges and proprietary institutions in the area?
Matriculation	213	To what extent is matriculation to and from other institutions desirable?
	213.1	Will students graduating from this program be able to matriculate at other institutions for advanced degrees? *114.4*
	213.2	Will students from pre-college occupational programs be able to matriculate in this program?
Internal planning considerations	220	
Intents and purposes of the college	221	Is the program congruent with the authorization, purposes and objectives of the college?
Existing programs	222	Does the program complement or conflict with existing programs at the college? *332*
Program modification or deletion	222.1	Will the program replace or incorporate any existing programs of the college?
Participation in other programs	222.2	In which courses outside the program are students likely to enroll?
Influx from other programs	222.3	Which of the courses in this program might draw students who would normally take courses in other programs?
Projected programs	223	Does the program complement or conflict with proposed or projected vocational programs of the college?

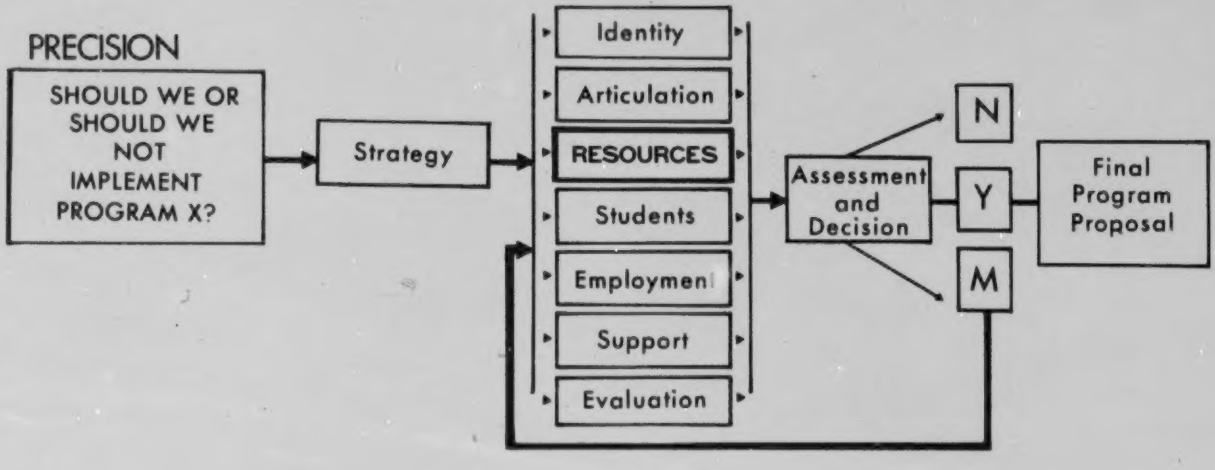
Discussion

Few programs succeed because they consider Articulation, but many fail because they do not. In times when institutions and departments compete for students, Articulation becomes an important subsystem in planning. It is important for planners to know which institutions and/or departments might be adversely affected by the loss of anticipated students into new programs. Similarly, planners should be aware that other institutions or departments might accrue benefits by the attraction of students into a particular program. To illustrate, a new program in auto mechanics might concern another college that attracts out-of-district students to its program. However, the same program might please local English teachers because it puts new students in their courses.

References

1. The University of the State of New York. Education Beyond High School. The Regents Tentative Statewide Plan for the Development of Post-Secondary Education. (Albany: The State Education Department, 1972).

300 RESOURCES



The Resources subsystem determines the costs and revenue necessary for implementing the proposed Identity of the program. The subsystem first asks the planner to describe the frame factors, that is, the physical, personnel and administrative requirements of the program. Then the planner estimates costs and revenue for the program.

The planner might find it necessary to refer to this subsystem several times in the planning process as he or she adjusts estimates on the basis of judgments in the Students and Identity subsystems. Ideally, the resources frame factors are based upon instructional planning considerations (i.e., 130). Once specified, these frame factors account for the costs of the program, then, ideally, adequate revenue is raised to support the program's costs. Therefore, an ideal procedure is to determine frame factors after considering a program's Identity, then to determine the program's costs and, then, to compare available revenue with costs. However, in times of scarce revenues, one can expect to adjust the costs of the program because available revenue is limited. In turn, this adjustment affects the frame factors of the program. These adjustments might lead to modifications in the Identity subsystem.

Frame Factors	310	
Personnel Qualifications	311	What educational, personal and work qualifications should the faculty for this program have? *123, 130*
Class Size	312	What is the maximum class size possible for implementing the program's chosen teaching strategies? *123, 130, 420*
Faculty-Student Ratio	313	What is the minimum faculty-student ratio necessary for this program? *183, 130*
Time	314	Does the design of the program precipitate time limitations or scheduling problems? *134, 130, 430*
Intact blocks of time	314.1	Does the use of labs or studio courses suggest the use of extended period schedules?
Alternating semesters	314.2	Does the incorporation of cooperative education experiences suggest students will alternate semesters of work and study and courses will be offered in alternate semesters?
Modular instruction	314.3	Does the incorporation of modular units suggest the need to restructure course schedules within semesters?
Initial Capital Investment	315	Does the program require a substantial capital investment by the college? *123*
Buildings and space	315.1	Does the program require new buildings or specialized facilities for housing?
Equipment and materials	315.2	Does the program require costly equipment or materials for instruction?

Support Services	316	Does the nature of the program require the addition of specialized support services?
Counselling	316.1	Does the nature of the program suggest the need for additional counseling services? *450*
Placement	316.2	Does the nature of the program suggest the need for special placement services? *111.3, 540*
Financial aid	316.3	Will the program attract a student population that requires special financial aid services? *450*
Remedial work	316.4	Will the program require the support of remedial education services? *450, 123.3*
Clerical	316.5	Will the program require additional clerical support?
Costs	320	
Personnel Costs	321	What will be the cost of additional personnel for the program or the college?
Administration	321.1	What, if any, will be the cost of additional administrative personnel?
Faculty	321.2	What will be the cost of new faculty for the program? *123, 130*
Support staff	321.3	What will be the cost of additional support staff required by the program? *111.1, 450*
Counselling staff	321.31	What will be the cost of additional counseling staff and services?
Placement	321.32	What will be the cost of additional placement staff and services? *540*
Financial Aid	321.33	What will be the cost of additional financial aid staff and services?

Library staff and services	321.34	What will be the cost of additional library staff and services? *123*
Remedial services	321.35	What will be the cost of additional remedial teachers and services? *123.3*
Clerical	321.36	What will be the cost of additional clerical services?
Physical costs	322	What will the program costs be for physical resources? *130*
Space and buildings	322.1	What will be the cost of space and buildings for housing the program? Consider the long-term depreciation of debt. *123*
Equipment and materials	322.2	What for the program, e.g., furniture, lathes, laboratory equipment, etc.? Consider long term depreciation of debt. *123*
Operating costs	322.3	What will be the on-going operating cost for the program, e.g., electricity, mimeographing, etc.?
Revenue	330	
Funds	331	*450*
Federal funds	331.1	Can a grant be obtained for the program? What costs would it cover?
State and regional funds	331.2	Can special state or regional funds be obtained to defray program expenses?
Local funds	331.3	What special local funds are available to defray program expenses? Are new bond issues feasible?
Private foundation funds	331.4	What private foundation grants can be obtained for the program? What costs would they cover?
FTE funds	331.5	What is the revenue per Full-Time Equivalent (FTE)? (See FTE calculation discussion in the Students subsystem.) *423, 433, 434*

Special FTE funds	331.51	Can the program draw additional state or regional FTE funds because it is oriented to a special group of students? *451.2, 452, 453, 456*
FTE funds available to department	331.52	What proportion of the FTE funds will be available to the sponsoring department of the program?
Gifts and bequests	331.6	Have local individuals or agencies offered gifts to the program? Have they offered to bequeath funds to the program? (If applicable, add maintenance costs to costs section.)
Other Resources	332	What other resources may be available? *212, 222*
Modification of existing programs	332.1	Are resources available for the program through the modification of existing programs? *412*
Shared personnel	332.2	Are resources available through the sharing of faculty and support staff with other departments and programs?
Shared facilities	332.3	What shared outside facilities and services can be used to defray costs for the program? (Are industry laboratories or BOCES facilities available? Are consortium efforts feasible?)

Discussion

There may be many ways in which the planner can cut the costs of a program. Three such ways deserve special mention: space utilization, class size, and shared resources.

Space Utilization (2). Plant costs might be diminished by more effective utilization of existing facilities. National studies indicate that classroom utilization is only 60 per cent of capacity and laboratory utilization only 45 per cent. Two possible means for improving utilization are effective morning-afternoon class scheduling and block scheduling of students or instructors.

Class Size (2). The size of classes greatly affects costs. The following are some suggestions for reducing low enrollment classes: offer essential courses in alternate semesters or years; examine possibilities for sharing class offerings with neighboring colleges (see shared resources below); schedule two labs or other classes that will serve more than one program at the same time with the same instructor; offer a common core of introductory courses to the proposed and established programs.

Shared Resources (1). The development of a costly program might be facilitated by the use of existing facilities within the college, community or region. Planners should consider the use of existing staff or facilities within their college. In order to facilitate regional cooperation, Title III of the Higher Education Act of 1965 has provided funds for community colleges to establish consortium and cooperative arrangements for sharing resources. Consortium colleges might share library, computer or staff services, equipment or materials.

Despite the consideration of these factors, new occupational programs often cost a great deal to establish. Therefore, planners need to measure the short and long-term costs of a program and the amount of capital expenses that can be covered by outside money.

If a program requires a large amount of new physical plant costs, the planner should compare the initial costs of the program with the long-term, depreciated costs. Initial revenue and long-term revenue should be compared as well. Then the planner can see whether cost-revenue discrepancies occur initially or throughout the life of the program. Also, in long-range planning, the planner can estimate the enrollment of students over a period of several years. A program that is expensive to develop might be able to add students at little or no marginal cost to the college. The program might become self-sufficient in a few years, despite a large, initial investment by the college (1).

Funds for high cost programs might be secured from governmental or private agencies. Governmental funds, such as Vocational Education Act (VEA) money, might be available for the establishment of a program. Non-governmental sources include corporations, foundations, local businesses, individuals and organizations. Many books and articles have been written about the search for such funds. For example, planners might consult The Foundation Directory, Where America's Large Foundations Make Their Grants, and The Chronicle of Higher Education for information about the sources, purposes and amounts of foundation grants available for educational programs.

After a planner has examined the general costs and revenue of the program, he or she should compute the number of FTE that will cover those program costs that are not covered by other funds. This computation provides important information for both the Students and Identity subsystems of investigation.

The computation might be affected by two considerations. First, the program or department might get only part of the FTE revenue which is generated by the total college enrollment of the students. Colleges compute FTE benefits differently. Second, different students bring in different revenue to programs and colleges. A program that attracts impoverished students might bring in greater revenue per student (e.g., from state or federal agencies) than a program that does not. Of course, such a program might also require costly services to meet the needs of these students.

Simplified examples of the FTE computation are provided below:

	Total program costs	$100,000
-	Program funds	52,000
	Costs to be covered by FTE revenue	48,000

A. At College A, the program receives $1200 of a total of $2000 per FTE revenue. Thus,

$$\text{Required FTE} = \frac{\text{costs to be covered by FTE revenue}}{\text{amount of revenue per FTE}} =$$

$$\frac{48{,}000}{1{,}200} = 40 \text{ FTE}$$

The program requires 40 FTE to cover its costs. However,

B. At College B, the program receives $400 more per FTE because it attracts special students. The costs and basic program share of revenue stay the same. Thus,

$$\text{Required FTE} = \frac{48{,}000}{1{,}600} = 30 \text{ FTE}$$

The program requires only 30 FTE to cover its costs.

This procedure is not the only one available for the computation of the costs and revenues of a program. In recognition of the importance and variability of resources planning, several cost simulation models have been developed to help planners. Among the available models are: Comprehensive Analytical Methods for Planning in University Systems (CAMPUS), developed by Systems Research Group; Resource Requirements Prediction Model (RRPM), developed by Mathematica for The National Center for Higher Education Management Systems (NCHEMS); and cost Estimation Model (CEM), also developed for NCHEMS (1).

References

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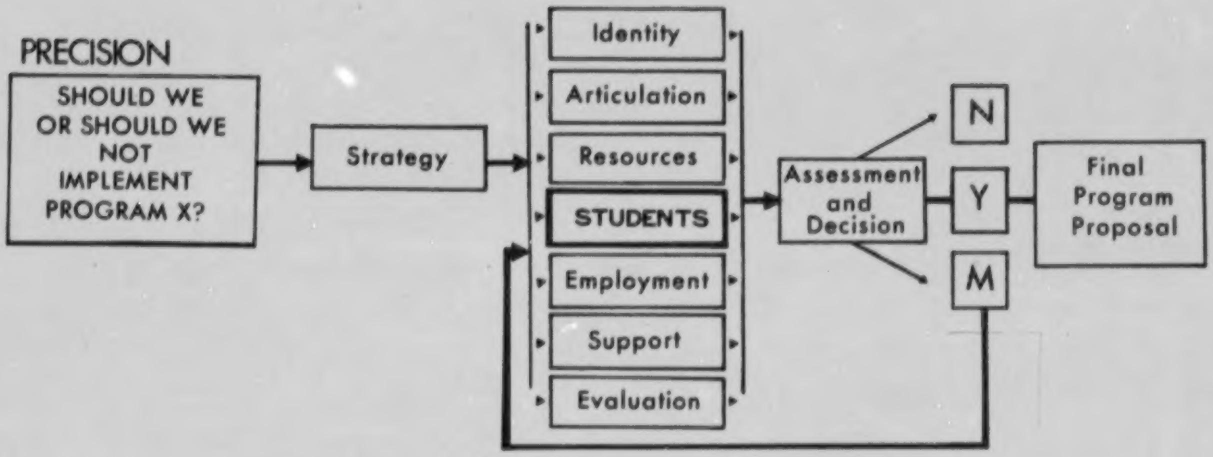
400 Students



This subsystem provides a framework for projecting enrollments, attendance patterns, completion rates and student characteristics for the proposed program. Enrollment figures are used to estimate the FTE per semester. This estimate is important in the calculation of revenue for the proposed program.

The questions comprising this subsystem may be answered in any order. However, the planner should note the many interactions of this subsystem with Resources and Identity. Knowledge of these interactions is probably more important than the sequence of questions in this subsystem.

Status	410	
New students	411	How many new students will the program attract to the college?
Internal transfers	412	How many current students are expected to transfer into the program from other programs at the college? *332.1*

Continuing and returning students	413	How many students are expected to return to the college to enroll in the program?
Special students	414	Are any special or extramural students expected to enroll in the program?
Expected Enrollment	420	*623*
Full-time	421	How many students are expected to participate full-time in the program each year?
New	421.1	How many full-time students are enrolling for the first time?
Continuing	421.2	How many are continuing or returning students?
Part-time	422	How many students are expected to participate part-time in the program each year?
New	422.1	How many part-time students are enrolling for the first time?
Continuing	422.2	How many are continuing or returning students?
Expected FTE	423	Considering the expected full-time and part-time enrollment, what are the minimum and maximum estimated FTE per semester? *331.5*
Attendance Patterns	430	*132, 314*
Time and days of attendance	431	How many students are expected to attend during the day, evening, or weekends?
Regularity of attendance	432	How many students are expected to alternate periods of attendance with periods of non-attendance?
Attrition	433	How many students are expected to withdraw from the program before completion?
Impact on FTE	434	Will varying attendance patterns substantially affect the FTE per semester?

Graduation	440	How many students will graduate from the program each year?
Special Student Considerations	450	*121, 130, 331*
Residence	451	Will the residence of enrolling students affect the program? *510*
In-district	451.1	How many students from the district are expected to enroll in the program?
Out-district	451.2	How many students from other districts are expected to enroll in the program? Does the local district have chargeback arrangements with other districts?
Socio-economic status	452	Does the program expect to attract students from a particular economic background? What background and how many students?
Ethnic background	453	Is the program expected to attract students from a particular ethnic background? What background and how many students?
Sex	454	What proportion of each sex is the program expected to attract?
Age	455	What age range is expected among the enrollees? Is a particular age group desired?
Other characteristics	456	What other characteristics are desired or expected in the enrolling students, e.g., physically handicapped, veterans, students with previous degrees, etc.

Discussion

Projecting student enrollment is, perhaps, the most difficult task for program planners. Most available projections are based on large groups such as high school seniors or college freshmen. Also, they are derived from mathematical formulas that do not consider variables such as changing lifestyles or the condition of the economy (2,3). The following models for student flow and cost projection have been developed to help college planners: Comprehensive Analytical Methods for Planning in University Systems (CAMPUS); Computer-Assisted Planning for Small Colleges (CAP:SC); and the student flow model of the National Center for Higher Education Management System (NCHEMS) (1,2).

During his or her research, the planner might have uncovered information about the types of students who might enroll in the program. This information might come from the following sources: other colleges that offer the same program; attendance in related programs; employer expectations, etc. The planner might wish either to limit consideration of student characteristics on the basis of this information or to expand the potential population.

The planner might answer the questions of this subsystem a few times. He or she might develop several scenarios of the potential students in the program. Then, as in the Employment subsystem, each scenario might be evaluated in cooperation with other personnel, e.g., high school teachers, college admissions officers, employment counselors, and/or representatives of business.

Either before or after the development of the possible scenarios of student populations, the planner might wish to learn more about the student market within the college district. This in-depth research might be carried out in several ways: a) paying for a professional market survey or undertaking an individual survey; b) investigating the potential student market among high school seniors; c) using census data to plot the locations of potential students within the community; d) conducting a house-to-house canvass; e) surveying former students (1). These techniques help to validate the planner's research and to promote the college and the program to potential students.

If the planner has computed the Resources of the program before this time, then he or she has determined a goal figure for student enrollment in the program. This figure might be vastly different from the enrollment projections that he or she has made in this subsystem. The discrepancy must be resolved eventually, perhaps in a change of Resources and Identity requirements for the program. First, however, the planner should examine ways to diminish the discrepancy through the recruitment of students into the program. The following paragraphs discuss the recruitment of three different types of students to the program; high school seniors, non-attenders, and disadvantages.

Most colleges tend to rely on the enrollment of students from particular feeder high schools. They tend to ignore the potential students who might graduate from non-feeder schools in the district or outside it. Some non-feeder high schools send few graduates to college. Their graduates might be potential students in the program, if the program staff makes an effort to recruit them.

Other potential students include adults or youth who do not attend any educational institution at present. These individuals might be recruited through local advertising. The planner might wish to answer the following questions about the recruitment of these potential students:

What method might be used to inform the non-high school public?

Advertising in: local newspapers?
local radio and TV stations?
local industries?
supermarkets/shopping centers?
public transportation?
community centers?
civic/community service organizations?
places of entertainment?
other?

Will any method of feedback from local advertising be used?

postcards?
newspaper clips?
telephone calls?
requests for catalogues?
application forms?
other?

If the planner anticipates the enrollment of socio-economically disadvantaged students, then he or she is probably aware of the existence of special financial aid for these students, e.g. Basic Opportunity Grants. However, the potential students might not be aware of these grants. They might be more aware of the costs of tuition or books or transportation that inhibit their attendance at the college. If the planner expects disadvantaged students to enroll in the program, then he or she should make approproate allowances for the time and money that are required to insure their recruitment, enrollment and completion of the program.

Other groups of students provide different recruitment problems. At this point, the most important concern of the planner is to be aware of the needs and problems of recruitment. In some cases, students will be readily available for a program. In fact, some programs might seem justifiable simply because potential students are plentiful. In more cases, however, students will have to be recruited in order to justify the establishment of a program.

The skillful planner will know who and where the students are and what is needed to get them into the program.

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6. ________________, ________________. Fall Enrollment in Higher Education. 2 vols.: Summary Data and Institutional Data. Annual.
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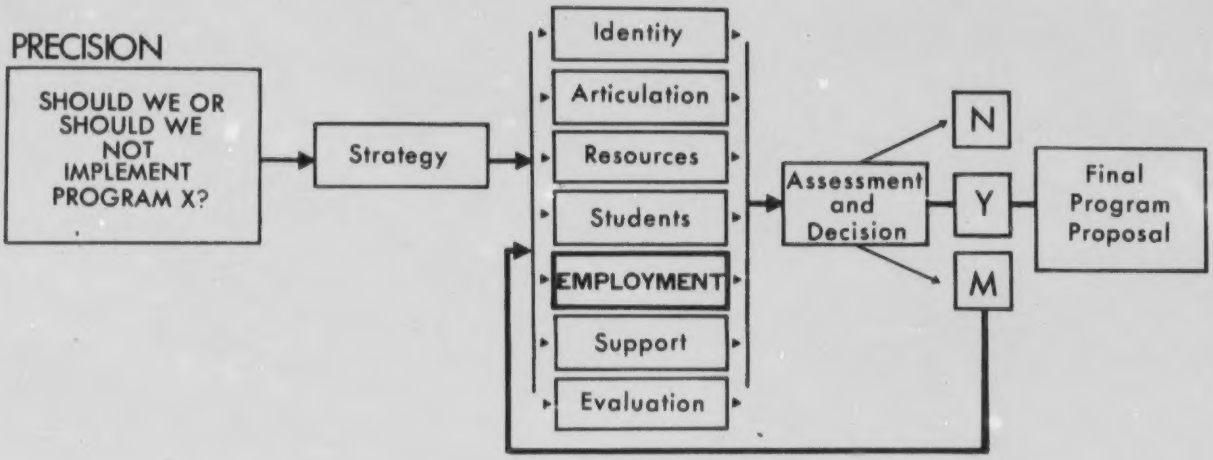
500 Employment



This subsystem helps educators form opinions about future labor markets. Market projection techniques are discussed even though labor markets cannot be predicted with great accuracy. The emphasis is on making sound judgments about the probabilities of market conditions. Four key areas are discussed: 1) market delineation, i.e., the geographical and occupational market of interest; 2) demand factors, i.e., the replacement and growth rate of jobs in the market; 3) supply factors, i.e., the number of eligible people for the jobs; and 4) validation and promotion, i.e., checks on the market estimates.

The general procedure for using this subsystem is as follows:

1) The planner delineates the geographical and occupational market of interest.
2) The planner then considers both demand and supply factors in the market.
3) The planner validates his or her estimates in the field and at the same time promotes the program.

Market Delineation	510	*114, 451, 212*
Geographical region of interest	511	What is the geographical boundary of the market of interest? What is the expected geographical distribution of graduates seeking entry into the work force?
Occupation of interest	512	For what occupational roles will the program prepare students? Are there special requirements for employment in the field; e.g., certification of health requirements? *112, 114.2*
Market of interest	513	What facts are known about the market of interest?
Future trends	513.1	What future trends may be reasonably assured?
Detail of analysis	513.2	Given the definition of the market of interest, what level of market estimation is required: e.g., how detailed should the market analysis be?
Demand Factors	520	*440*
Positions available	521	How many identifiable positions are available in the region of interest at the moment?
Future positions available	522	What are the optimistic and pessimistic market projections for the future?
Employability	523	What proportion of graduates will be able to find employment in the market of interest?
Mobility	524	What proportion of graduates will pursue further education or leave the region of interest?
Supply Factors	530	*212*
Graduates per year	531	How many graduates are released from colleges to this market each year? What are the projected graduation rates in these colleges for the occupation of interest?

Employability	532	How many of these graduates have been unable to find employment in the field? Why?
Validating and Promoting	540	*316.2, 321.32, 624*
Validation	541	Which employers intend to employ graduates?
Number employable	541.1	How many per year?
Salaries	541.2	With what median and/or modal starting salaries?
Positions	541.3	In what positions?
Advancement	541.4	With what prospects for advancement?
Promotion	542	What are the prospects for influencing the market?
Activities tried	542.1	What promotional activities have been tried and with what results?
Others	542.2	What other activities or contacts could be explored?

Discussion

It is helpful to consider labor market projections as developing through four stages:

1. Identifying the market of interest.
2. Projecting demand.
3. Projecting supply.
4. Using 2 and 3 to form a preliminary market estimate which is then subjected to a validation/promotion procedure.

These four stages are discussed below. Major sources of data are identified and some procedural considerations and alternatives are highlighted. It is hoped that this discussion serves as a useful starting guide for readers with little or no background in labor market analysis.

1. *Identifying the market of interest.*

(a) Geographical region of interest.

Factors determining this region are: 1) The nature of the occupation and expected dispersion of graduates; 2) The region from which the college draws its support (in terms of student residence and political support).

It is expected that the geographical region of interest will usually be defined as the support region. The nature of the occupation, however, might influence one's assumptions about the percentage of graduates likely to remain in this region.

In addition, the college support region may not coincide with any New York State employment region. In this case consideration must also be given to the market in nearby denser employment regions, and to the number of graduates who might be absorbed in such regions.

(b) Occupation of interest.

Some occupations are well defined and relate closely to well-defined programs (e.g., inhalation therapy, registered nursing). On the other hand, there are occupational groupings with boundary conditions which admit people with quite varied backgrounds (e.g., many clerical occupations). In addition, some well-defined programs lead to somewhat diverse occupational possibilities (e.g., accounting).

Identifying the total market of interest depends on establishing the geographical region(s) of interest and the occupational boundaries. The particular regional/occupational mix determines, to a large extent, the ease or difficulty of making projections, and will also affect the worthwhileness of such an attempt.

For example, in considering a program to train inhalation therapists, market estimation would be important because, in this case, specific training is linked to a specific job. The employment prospects for graduates therefore depend heavily on a well-defined occupational market.

On the other hand, in considering a program to train accountants, since there exists a steady national demand for such people over a very wide cross-section of industries, the worthwhileness of detailed regional projections seems questionable. A sufficient enrollment estimate for such a program could probably be gained by reducing national estimates on a simple population proportion basis.

2. *Projecting demand.*

Demand (i.e., number of job openings) depends on the rate of occupational growth and on the occupational replacement rate.

Replacement rate seldom changes dramatically, and provides some stability in future demand estimates. The importance of growth rate depends on its relationship to replacement rate. The greater the replacement rate relative to growth the less effect errors in projecting growth will have on estimates of job openings. For example, suppose one wishes to estimate job openings over a ten-year period with no more than 10% error for an occupation with an actual growth rate of 20%. Then, if the replacement rate is 0.5% annually, an error of 13% in estimating growth will still keep the job-openings estimate within the required error limits. If the replacement rate is 6% annually, then an error as high as 40% in estimating growth rate will not lead to greater than 10% error in the job-openings estimate (see 12c, p. 4, 5, 10). Thus the seriousness of error in growth rate estimates depends on the ratio between growth rate and replacement rate.

The New York State Department of Labor (1,2) provides regional job-opening estimates for more than 170 occupations. The U. S. Department of Labor (7) provides national estimates for 232 occupations. These sources are recommended for use when applicable. When these sources do not contain the required information, it may be necessary to estimate regional projections from national census data. A recommended approach (described in 12a) is to apply national industry/occupational ratios to regional industry estimates (which requires development of regional estimates as a first step). Having thus estimated change due to growth, occupational replacements must be added to form job-opening estimates.

3. *Projecting supply*.

Because of the paucity of data, very little useful literature has been published about occupational supply (see 7).

Three basic supply questions are --

(a) What proportion of job vacancies in the occupation (base year) was filled by new graduates?

(b) How many graduates are released from colleges to this market each year? (And what are the projected graduate rates in these colleges for the occupation of interest?)

(c) Could the ratio of new graduates to others gaining jobs in this occupation be changed?

The answer to (b) should, in principle, be easy to determine. Question (a), on the other hand, would seem to require extensive regional data collection efforts. If question (a) can be reliably answered, one can then ask [with (c)] --

- * Does this pattern exist because too few graduates apply for such jobs?
- * Do employers have misgivings about the kind of training offered or proposed? If so, what are the implications?
- * Do employers properly understand the roles for which graduates may be fitted?
- * How does/can the college contribute to the continuing education needs of members of the work force seeking promotion into this occupation?
- * If the predicted occupational growth rate is high, how will this affect employment for graduates? What changes in recruitment patterns and/or inservice training are industries likely to adopt? Will such changes improve or worsen the market for college graduates?

Thus, one needs not only to make supply projections, but to understand the factors which govern the supply situation. The latter is particularly important, since promotional activities are likely to be directed towards changing the pattern of supply in the market (i.e. attempting to improve graduates' standing in the market). The basic demand characteristics of a market are less easily influenced.

4. *Validating and promoting.*

Given some estimates of supply and demand, one can form opinions about the likely market from the base year up to the projected year. The longer the projection span, the less reliable the estimate will be. It is suggested that projections more than ten years beyond a base year are probably not worth making. The U. S. Department of Labor has prepared a research report (12e) showing error rates in predictions over the 1950/1960 period using the prediction method recommended earlier in this outline (12a).

At this stage, then, one is able to check an estimate against all possible sources and simultaneously engage in program promotion. This activity is very valuable, regardless of the accuracy of the initial projections, since it provides a focus for dialogue with industry and an opportunity to influence market conditions. It is recommended that placement personnel be included in this stage of endeavor (if not throughout), since it enhances their access to relevant information and strengthen their contact with employers. For similar reasons, some teaching faculty may also be included.

In checking estimates with employers, it is important to consider:

(a) How well the contact person really understands his firm's future needs.

(b) How willing he or she is to be frank.

(c) What contingencies might alter the opinion of the contact person.

With respect to (c), not only should the planner seek opinions about his estimates and about a firm's future needs, but he should also ask what factors are most influential in determing a firm's needs. What assumption does the firm make in projecting future growth? What factors could substantially alter the picture?

Several sources can be used to check estimates:

- * Business and professional associations.
- * Labor unions.
- * Planning authorities who may know of some important projected development.
- * The market analyst in the nearest U. S. Department of Labor office.
- * The local employment office (NY State) for information based on employment insurance.

Finally, it might be possible to formulate an estimate in terms of pessimistic and optimistic projections based on varying market assumptions and error estimates. For example, predicted growth and replacement rates might be used to assess potential errors in job-opening projections. Other market information (determined in supply and validation stages) may provide a reasonable basis for making judgmental adjustments to final upper and lower projections. Forming such "confidence intervals" should aid decision making.

References

Abbreviations used: USDOL . . . U. S. Dept. of Labor
BOLS . . . Bureau of Labor Statistics
MAP . . . . Manpower Administration Publication
NYSDOL. . . NY State Dept. of Labor
DRS . . . . Dept. of Research and Statistics

1. NYSDOL, DRS: Manpower Requirements. Interim projections for N.Y. State 1968-80. July 1971.

2. NYSDOL: Comprehensive Manpower Plan. May 1973.

3. NYSDOL: Manpower Review.) Serials providing very general
   Manpower Trends.) regional information.

4. U. S. Bureau of Census, U. S. Census of Population: 1970 Classified Index of Industries and Occupations; Occupational Characteristics.

5. USDOL, BOLS: College Educated Workers 1968-80. Bulletin 1676.

6. USDOL, MAP: Guide to Local Occupational Information. 4th Ed., 1973,

   Indicates information available from district offices.

7. USDOL, BOLS: Occupational Manpower and Training Needs. Bulletin 1701.

8. USDOL, BOLS: Occupational Outlook Handbook, 1972-73 Edition. Bulletin 1700.

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11. USDOL, BOLS: Occupational Outlook Quarterly.

12. USDOL, BOLS: Tomorrow's Manpower Needs.

    Five volumes concerned with the use of national manpower projections in developing State and area manpower projections.

    (a) Bulletin 1606 (Vol. I, Feb. 1969): Developing Area Manpower Projections.

    (b) Bulletin 1606 (Vol. II, Feb. 1969): National Trends And Outlook. Industry Employment and Occupational Structure.

    (c) Bulletin 1606 (Vol. III, Feb. 1969): National Trends and Outlook. Occupational Employment.

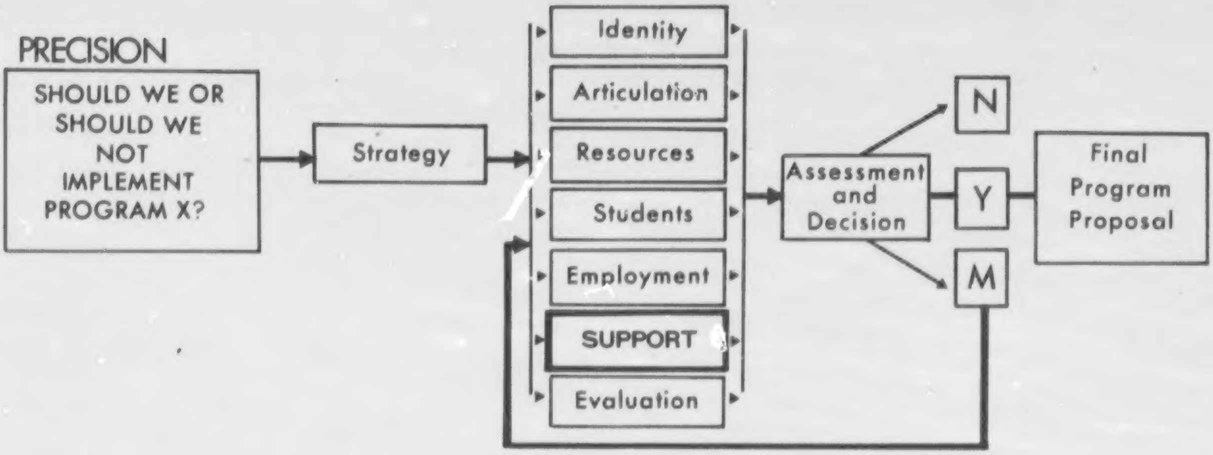
    (d) Bulletin 1737 (Vol. IV, Revised 1971): The National Industry and Occupational Matrix and Other Manpower Data. (The 1970 matrix in this report is preliminary and will be revised using 1970 census data.)

    (e) Bulletin 1769: Research Report on Manpower Projection Methods.

13. USDOL: Dictionary of Occupational Titles.

14. USDOL, BOLS: Concepts and Sources of Data for Manpower Analysis. Bulletin 1816.

600 SUPPORT



The Support subsystem examines internal and external support for the program. The general support of the administration, faculty and students is desirable; indeed, commitment to the program is essential by those who will be responsible for its implementation. In addition to these internal factors, the subsystem examines external factors of support and commitment.

The questions in this subsystem may be answered in any sequence.

Internal Support	610	
General internal support	611	To what extent do administrators, faculty and students have positive or negative opinions about the program?
Specific levels of support	612	What groups within the college support or are committed to the program?
Advisory committee	612.1	Is there a specific commitment to the program by the program advisory committee?

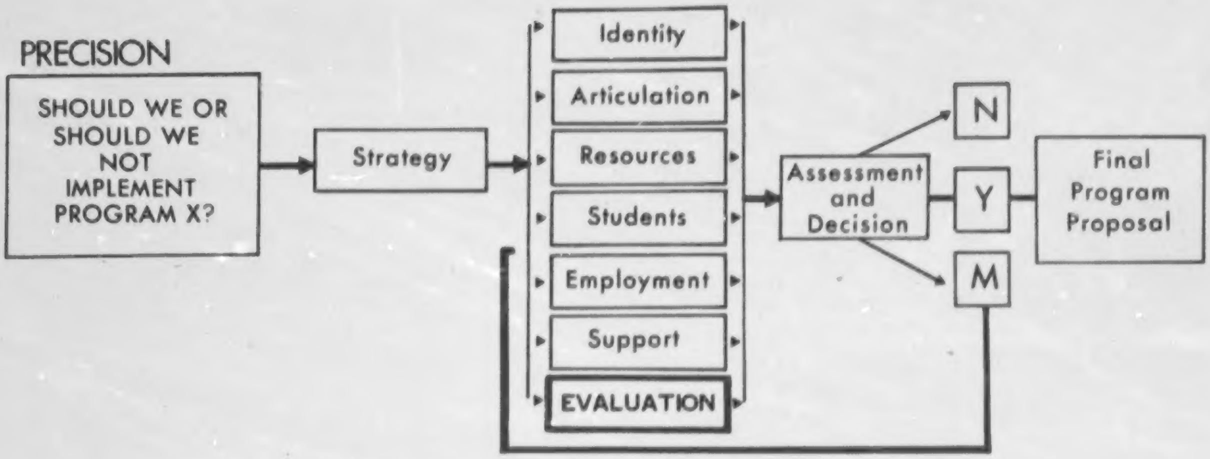
College curriculum committee	612.2	Does the college curriculum committee approve and support the program?
Faculty involved in the program	612.3	Is there commitment to the program from faculty who will be directly involved with the program?
Administrators	612.4	Is there commitment to the program from the academic dean, the president, or other administrators who will be directly or indirectly responsible for the program?
External Support	620	
General external support	621	Is there support or opposition to the program from other institutions in the region? *212*
Financial support	622	Is there financial support for the program? *320, 330*
Student support	623	Will sufficient numbers of students enroll in the program? *420*
Support from employers	624	Are employers planning to provide jobs for graduates? *111.2, 541* Will a sufficient number of employers participate in any work study, field work, or internship aspects of the program? *130*
Community support	625	Is there community support for the program from organizations, agencies, unions or other local groups? *111.2*

Discussion

Support within the college can be considered in degrees: (a) opposition, (b) verbal or written support, and (c) commitment. be given to the first and last of these. Internal resentment or skepticism can hinder a new program and should therefore be minimized. Also, an abundance of positive regard for the program is not so valuable as the commitment of the people who will conduct it or carry the responsibility for it.

The Support subsystem interacts strongly with other subsystems. In fact, this subsystem might be considered a summation of the judgments of four other subsystems. As the planner may have noticed, questions 611, 622, 623 and 624 interact, respectively, with judgments in the Articulation, Resources, Students and Employment subsystems. Positive or negative judgments in those subsystems lead to positive or negative answers to the questions about Support.

700 EVALUATION



When a new program is developed, the college is often expected to plan for a future evaluation of the program. Evaluation is usually thought of as the process of delineating, obtaining, and providing useful information for making decisions and/or judgments about a program. The planner will delineate what data will be collected about the program. Persons carrying out the evaluation will obtain this information and provide it to the decision makers.

This subsystem is meant to help two-year college personnel plan an evaluation rather than conduct one. The Evaluation subsystem focuses on the identification of those aspects of the program which need to be examined during an evaluation.

Two steps are usually taken in planning an evaluation:

(1) The rationale of the evaluation is stated. A rationale answers the question "why is the evaluation being done?"

(2) The appropriate elements of the program are identified for examination.

These steps form the basis of the evaluation design. Later, two other steps are necessary:

(3) The data or information is gathered.

(4) The data is compared to standards in order to make judgments about the program.

Data gathering and decision making will be much easier if the evaluation is carefully planned and well organized. However, college personnel are often unable to do as extensive a job of planning and of conducting program evaluations as they would like. This subsystem outlines some of the evaluation activities which are possible; the evaluation planner can then decide what is feasible for his or her particular situation.

The Rationale

The rationale is the justification for the evaluation. It can answer several questions:

(1) What are the purposes of the evaluation?

(2) What judgments or decisions need to be made about the program?

(3) What aspects of the program would be worthwhile to examine?

These questions are all ways of asking: Why should an evaluation be done?

The rationale can be very simple. The college might want to know only whether to drop, modify, or expand the program. Or the rationale may be very elaborate. If so, many program components might be examined in order to answer many kinds of questions. For example:

Has the program been implemented as planned?

Are the graduates of the program able to find jobs?

If the program is modified, what aspects of it will be changed?

Did the students achieve the cognitive and attitudinal outcomes which were intended?

Were there enough support staff for the program?

These and many other questions may come to mind when an evaluation is being planned. It is the job of the evaluation planner to determine the scope and priorities of the evaluation by specifying questions and indicating their relative importance.

In order to determine the rationale, the evaluation planner might talk with potential users or audiences of the evaluation. Persons in the college, the community, and the statement may list different information which would help them make decisions about the program. For example, the state education department might want to know whether or not the program attracted enough students. The counselling staff, for its part, might want to know whether or not students are satisfied with the program and their subsequent jobs. Different needs such as these can be met by a comprehensive evaluation. Consulting the possible audiences of the evaluation minimizes wasted effort and increases the usability of the evaluation.

But what if no one at the college knows what questions need answering, or what decisions need to be made? Does this mean that an evaluation cannot or should not be done? In other words, is it impossible to plan an evaluation for an undetermined audience and an unknown decision? Not necessarily. Sometimes the rationale for the evaluation is merely to keep account of or gather data about critical aspects of a program. In any case, the rationale leads the planner to the task of selecting the program elements to be examined.

The Elements

Once the rationale has been established, the planner can choose the elements of the program which will be examined. Part of this work might have already been done in formulating the rationale. However, the planner might find it helpful to list exactly what information will be collected in order to keep account of how a program is operating.

Some planners might choose the elements by rereading the System and selecting critical elements from it. Other planners might not wish to review the entire System in order to choose the elements of the evaluation. For these planners, an abbreviated outline is included that contains some of the elements which might be valuable in a program evaluation.

Evaluation Elements

A. Considerations Prior to the Start of the Program ("antecedents")

1. Student types

    a) previously acquired knowledge and skills of entering students

        i) knowledge
        ii) competencies
        iii) attitudes and values

    b) Student characteristics

        i) status (e.g., new students, transfers, etc.)
        ii) geographic distribution
        iii) socio-economic status
        iv) ethnic background
        v) sex
        vi) age
        vii) work and educational experience

2. Student numbers

    a) enrollment figures
    b) attendance patterns

3. Resources

a) personnel costs

i) administration
ii) faculty
iii) support staff
iv) clerical staff

b) physical costs

i) space and buildings
ii) equipment and materials
iii) operating costs

4. Local support

a) internal support

i) advisory committee
ii) college curriculum committee
iii) faculty involved in the program
iv) administrators
v) other internal support

b) external support

i) financial support
ii) student support
iii) support from exployers
iv) community support

5. Employment possibilities

a) number of jobs
b) types of jobs
c) salary
d) advancement potential

B. The Educational Process ("transactions")

1. General teaching strategies

a) for knowledge
b) for competencies
c) for attitudes and values

2. Special teaching strategies
    - a) internships and labwork
    - b) cooperative education
    - c) modular curriculum
3. Utilization of facilities and instructional materials
4. Social-attitudinal climate
    - a) participation
    - b) morale

C. Effects of the Program ("outcomes")

1. Effects on students
    - a) learning outcomes
        - i) knowledge
        - ii) competencies
        - iii) attitudes and values
    - b) occupational outcomes
        - i) number employed in program-related jobs
        - ii) average salary
        - iii) job performance levels
        - iv) length of employment
        - v) advancement
        - vi) range of jobs
        - vii) geographical distribution of employed graduates
        - viii) sex, ethnic and SES distribution of employed graduates
2. Effects on college
    - a) college image and morale
    - b) college enrollment
        - i) number
        - ii) quality
        - iii) distribution
3. Effects on community
4. Effects on region
5. Effects on business and/or industry

Discussion

At this point the decision maker has chosen the elements for his or her evaluation plan. However, for the evaluation plan to be complete, it is still necessary to specify how the data for each element will be analyzed. That is, the planner needs to indicate the process by which judgments are to be made concerning the program.

The reader will notice that the list of elements suggests an organization of the data to be collected. Three kinds of evaluative data are listed: a) considerations prior to the start of the program (i.e., "antecedents"), b) the education process (i.e., "transactions") and c) effects of the program (i.e., "outcomes").

An "antecedent" is any condition with respect to students, local support, or employment existing prior to teaching and learning which may relate to outcomes. "Transactions" refer to the succession of engagements or encounters which comprise the process of education. "Outcomes" include the consequences of the program on students, the college, the community, the region, and/or business and industry. The boundaries between these categories are not, or need not be, always clear. The categories should stimulate rather than subdivide the data collection.

The analysis of data compares what the program had hoped for (i.e., its "intents") with what actually occurred (i.e., our "observations"). "Intents" include positive or negative statements about the plans for the program: perhaps classroom conditions or student behaviors or teaching strategies. But since "the road to hell is paved with good intentions," the evaluator must also examine what actually occurs, in other words, "observations." Observations provide evidence regarding the surroundings, events, and consequences of the program. Methods for collecting observational data include direct, personal contact and instruments such as inventories, biographical data sheets, interview routine, check lists, opinionnaires, and all kinds of psychometric tests.

The process of evaluation consists in first collecting data on what was planned for and on what actually occurred. Then judgments are made regarding 1) the appropriateness of the intents, and 2) the extent to which the intents were actually observed. It may be the case that the evaluation plan was executed exactly but the program failed because the plan was inadequate. On the other hand, the plan may have been adequate but was misimplemented or not implemented adequately. An evaluation scheme that includes both intents and observations yields diagnostic information regarding the reasons for a program's failure or success.

The data and comparisons suggested here can be represented by a matrix:

		Intents	Observations
Variables	Antecedents		
	Transactions		
	Outcomes		

This matrix is a procedural guideline for an evaluation. It is not the only guideline which can be used. The planner should feel free to modify this format, or to choose any other evaluation design which enables him to collect useful information for making judgments about his or her program.

References

The terminology and the general approach employed in the preceding paragraphs are discussed more fully in the following references. Any college planning a systematic evaluation would be well advised to consult these references before beginning to plan such an evaluation.

Two collections of readings are particularly helpful:

1. Taylor, Peter A. and Doris M. Cowley (Eds.). Readings in Curriculum Evaluation. Dubuque, Iowa: William C. Brown Co., Publishers, 1972.

2. Payne, David A. (Ed.). Curriculum Evaluation. Lexington, Massachusetts: D. C. Heath and Co., 1974.

In particular, the following works from these two collections are highly recommended. (1) and (2) refer to the two collections listed above.

Scriven, Michael. "The Methodology of Evaluation," pp. 28-48 (1)

Taylor, Peter A. and Thomas O. Maguire. "A Theoretical Evaluation Model," pp. 89-92 (1)

Stake, Robert E. "The Countenance of Educational Evaluation," pp. 90-102 (1)

Provus, Malcolm M. "The Discrepancy Evaluation Model," pp. 117-127 (1)

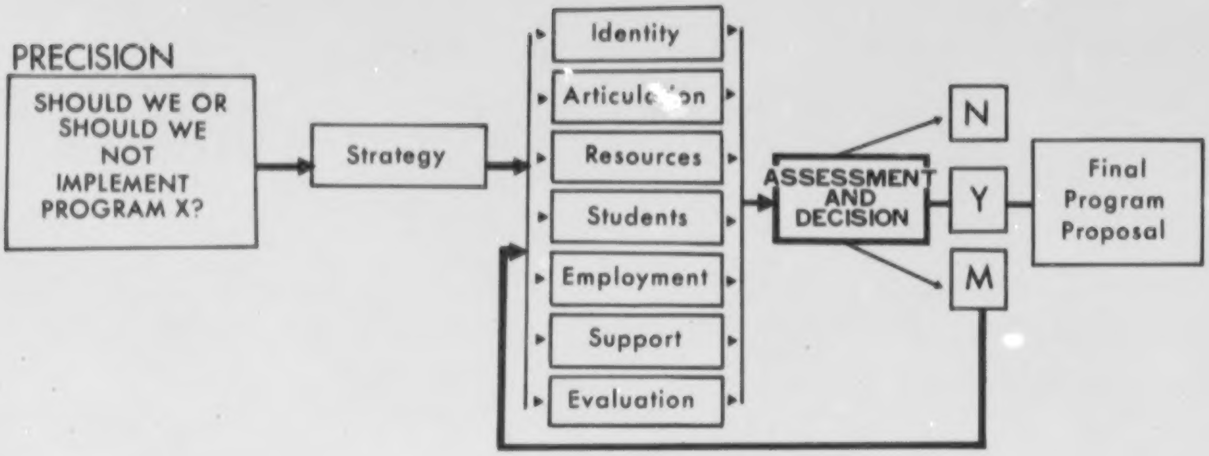
Krathwohl, David R. "Stating Appropriate Educational Objectives," pp. 69-80 (2)

Metfessel, Newton S., William B. Michael, and Donald Dirsner. "Instrumentation of the Taxonomy of Educational Objectives in Behavioral Terms," pp. 81-85 (2)

Metfessel, Newton S. and William B. Michael. "A Multi-Criterion Evaluation Model," pp. 143-151 (2)

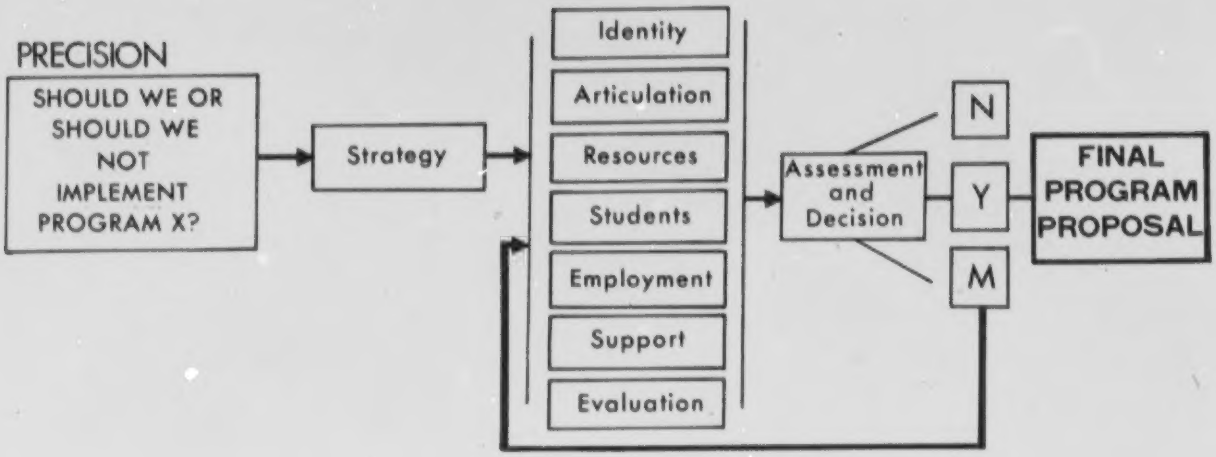
Thomas, J. Alan. "Cost-Benefit Analysis and the Evaluation of Educational Systems," pp. 163-169 (2)

ASSESSMENT AND DECISION



In this step of the precision phase, judgments are made and a decision is reached concerning the rejection, modification or approval of a program for implementation. Negative judgments result in the rejection of the proposed programs, provided it cannot be altered. If the judgments are unclear, then the planner may decide to re-examine the subsystems for the possible modification of the expectations for the program. Favorable judgments lead to the next step of the System, the formal program proposal.

PROGRAM PROPOSAL



If the planner decides that the program should be implemented, then he or she must submit a program proposal to the approval agencies of the college. These agencies and their concerns have already been discussed in the Strategy section of the precision phase.

In New York, if the program is approved for implementation at the college, then five copies of a formal program proposal must be submitted to the SUNY Vice-Chancellor for Academic Programs approximately six months before the proposed initiation of the program. The Vice-Chancellor has asked for the following information in the program proposal (1). The numbers at the side of the questions indicate the portions of the System that address the Vice-Chancellor's concerns:

A. *Identity (100)*

1. Title of the program
2. Degree, certificate, or diploma
3. Proposed beginning date
4. Description of the course of study or content, including the course descriptions in appendix. *(120)*

B. *Long-range Planning (200)*

1. Relation to University Master Plan. *(211)*
2. Relation to campus master plan. *(221)*
3. Relation to existing or other projected programs of the institution. *(222)*
4. Relation to existing programs at other institutions, public and private, in the service area, region and State *(212)*

C. *Resources (300)*

1. Faculty and staff: does the program call for faculty resources already present which might be reassigned, or will it depend on new appointments? Include vitae in appendix. *(311, 332)*
2. Facilities, including equipment and library holdings; are the present facilities adequate for the proposed program, or are additional facilities, equipment or library holdings required? *(315, 322, 332)*
3. Expenditures: describe initial and long-range costs, including method of support, outside sources and revenues. *(320, 330)*

D. Students (400)

1. Identity: will the program serve a special clientele (e.g. disadvantaged, handicapped, veterans, aged.)? *(450)*
2. Counselling: describe provisions. *(316)*
3. Demand: include potential enrollment for five years. *(420)*
4. Employment possibilities: include data for geographic area and the State. *(500)*
5. Articulation and transfer: describe potential for articulation of the program with preceding level and next appropriate level of instruction. *(213)*

E. Evaluation (700)

1. Academic quality and cost effectiveness: describe provisions for review.
2. Graduate programs: include special provisions.

F. Support (600)

1. Include local resolutions and support documents from faculty councils, where appropriate.

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PART TWO: HISTORICAL AND THEORETICAL CONTEXT

AN HISTORICAL SURVEY OF THE LITERATURE ON PLANNING OCCUPATIONAL PROGRAMS IN COMMUNITY COLLEGES

Literature on two-year college occupational programs began to proliferate after World War II. Phebe Ward (24) was one of the first writers to recommend a procedure for planning occupational programs.

First, Ward suggested that colleges study existing programs at other institutions. Then the need for the proposed program should be determined by a survey of potential employers within the local community. Employer needs for personnel should be ascertained as well as the types of positions for which two-year college graduates could be adequately trained. Then the needs of the student population should be explored by means of follow-up studies on recent graduates and pre-registration contacts with potential students. If the need for the program on the part of potential employers and students could be established, then an Advisory Committee should be organized to help plan the program. The Committee should consist of well-known leaders from labor, management and community groups. The Committee should be used throughout the lifetime of the program, not just in its planning stages. The objectives of occupational proficiency and total self-development of the student should then be established. On the basis of these objectives, an occupational analysis should name the courses, plan the objectives, list and arrange the jobs in learning order, analyze the jobs, and develop lesson plans. Modern equipment for the program must then be purchased and outstanding instructors selected. Instructors should be chosen from business and industry on the basis of their mastery of the occupation, personality, aptitude for teaching, and appreciation of well-rounded training. Instructional materials should then be developed and provision made for the student to have on-the-job as well as classroom experience. High standards of performance must be established, close coordination with parts of the college (such as counseling) maintained, and in-service training for faculty provided. The college should capitalize on available community resources and, in return, offer the use of college facilities to the community. Finally, good subjective and objective techniques for evaluating occupational training and general education should be devised and used for the purpose of revising the curriculum to meet student and community needs.

In 1950, Jesse Parker Bogue (6) encouraged the expansion of two-year vocational programs. His book emphasized that occupational curricula should be generated from community and state needs.

Two years later, B. Lamar Johnson (14) proposed a set of broad educational goals for vocational programs. He believed that vocational programs should enable students to perform successfully in an occupation. However, Johnson also felt that any two-year college program should enable students to acquire social understanding, formulate a philosophy of life, and carry out citizenship responsibilities.

Stephen E. Epler (10) discussed program planning in 1955. He suggested that two-year college administrators collect data on the following: the number of seniors in those high schools which have contributed significantly to enrollment in the college; the number of students in grades 1-12 in "feeder" schools; the births and deaths in the area for the past two decades; and migration in the age groups under twenty.

In 1956, Lawrence L. Bethel (4) emphasized the importance of community input in planning occupational programs. In particular, Bethel felt the need for a strong liaison between the two-year college and local business and industry. The community should also have an opportunity to evaluate the programs of the college even though the college should have considerable freedom to experiment with and develop new vocational programs. Faculty should spend time assessing community needs and revising progrmas in the light of changing social and economic conditions, and college administrators should take the responsibility of synchronizing community college plans with local business and industry.

The same year, 1956, Ralph R. Fields (12) agreed with Bethel about the importance of community needs and community participation in occupational program planning. Surveys should be made of employment possibilities in the area. Census data and state reports should be used as a basis for projecting possible enrollments. Continuous informal contact between employers and faculty could ensure that the college was meeting the needs of the community. Advisory committees should help develop vocational programs. Fields indicated four basic principles of program development: (a) a program must be need-centered; (b) everyone in the program must be concerned with its development and improvement; (c) the program must represent the uniqueness of the community in which it exists; and (d) evaluation is necessary for program improvement.

Edward Litchfield (17) analyzed college decision-making processes in 1959. He divided the processes into five separate steps: (a) definition of the issue; (b) analysis of the existing situation; (c) calculation and delineation of alternatives; (d) deliberation; and (e) choice. However, Litchfield felt that large colleges did not have an adequate control structure for decision-making. Professional administrators did not review decisions thoroughly. Instead, decisions were delegated to specific departments while administrators merely served as figureheads. Litchfield suggested that a number of academic vice-presidents should research issues and evaluate alternative courses of action. Organized staff meetings would consider possible alternatives to a given decision. The president should have sufficient staff to aid him in budgeting, personnel work, organization, academic research and total institutional planning. Litchfield felt that it was extremely important that decisions not be made by one person. In the five steps of his rational decision-making process there were roles for faculty, deans, president and trustees.

The problem of occupational program planning has been analyzed on the basis of student sensitivity to career opportunities. In 1961, survey was made of the post-high school plans of juniors and seniors in New Jersey high schools (18). It was found that the students were highly rational in their choice of occupational goals. Many of the students chose to pursue programs of study which would prepare them for positions in which there were serious shortages of personnel.

In 1964, B. Lamar Johnson (15) presented arguments for and against alternative practices in program planning. He then made recommendations on conducting effective surveys and on making good use of the advisory committee.

A year later, in 1965, Clyde Blocker, Robert Plummer, and Richard Richardson (5) described important elements in initiating a technical program. They believed that the curriculum should be closely related to the requirements of the occupation: it should be developed with the advice and support of the industry in question and it should be sensitive to changes in the occupation. Over-specialization should be avoided. The program should not be approved for all graduates. Community leaders should share the responsibility with educators for identifying manpower needs and planning programs to meet them.

In the 1966 edition of The Community-Junior College, James Thornton (23) discussed a community survey approach to occupational program planning. Administrators should base their decision on whether or not to introduce a new program on the results of the survey. If the program is introduced, a lay advisory committee should inform the community of the program and receive advice from community members. Special long-term advisory committees should be established for specific curricula. General questions to consider in the establishment of programs include the following: (a) How specialized should the program be? (b) How many liberal arts courses should be included? (c) Are there employment possibilities for students who finish the program? (d) Will students remain for the entire program? and (e) How qualified should a student be to get into the program?

Moses Koch and Priscilla Woolley (17) described their experiences in planning a program for urban planning assistants in 1967. They interviewed planning and development agencies in order to determine whether or not an employment market existed for urban planning assistants. Next, they developed curricula for the program. They had difficulties in finding professional planners who could take the time to help plan the program. Recruitment of students also posed many problems. However, since HUD sponsored the program, a full-time program director was hired to deal with these problems.

Also in 1967, Albert Riendear (19) discussed occupational education in a context of change. He analyzed a) the nature and objectives of post-high school education, b) community involvement with college programs, c) the specific functions of advisory committees, and c) the expectations of advisory committee members.

The 1968 Advisory Council on Vocational Education (2) made a series of recommendations for the improvement of occupational education planning. The recommendations included the following: increased awareness of the need for different kinds of training to meet different educational goals; clearer delineation of the relative responsibility of public agencies and private employers; further study of the merits of on-the-job versus institutional training programs; evaluation of the relative merits of the "work" and the "study" aspects of work-training programs; an analysis of the overlap among federal programs; exploration of new methods for finding the unemployed and motivating them to enter training programs; an analysis of the overlap among federal programs; exploration of new methods for finding the unemployed and motivating them to enter training programs; and evaluation of the effectiveness of existing training programs.

In 1969, M. H. Charness, C. H. Ritterhouse, and R. C. Heald (9) analyzed the major stumbling blocks in occupational program planning. The stumbling blocks include a) a lack of sufficient time to study problems, b) an excessive focus on the financial aspects of decision-making, c) a need to satisfy many diverse groups within the institution and the community, d) a lack of adequate research support, and (e) a failure to define goals in operational or measurable terms.

During the next year Brandon B. Smith and Jerome Moss, Jr. (21) discussed various steps in program development: (a) the specification of the role of training; (b) the identification of educationally relevant tasks; (c) the selection of what tasks should be taught; (d) an analysis of the tasks through Gagne's task analysis technique; (e) a statement of performance objectives; and (f) the specification of the instructional sequence. Smith and Moss emphasized the following changes in programs: increased focus on the "products" of instruction; greater task orientation; and greater appreciation for non-verbal and skill-related experience.

In 1970, John B. Teeple (22) stated that the college must allocate its resources according to clearly defined goals and well-ordered priorities. Manpower requirements must be projected in accordance with general trends and with the college's own goals such as health, education, and social welfare. The estimates of future job openings, due to attrition and to newly created jobs, must be included. The importance of national versus local manpower projections should depend on the mobility of the population served by the college and on the special characteristics, if any, of the region. Teeple concluded the article by posing the questions of how to develop and implement a plan. The answer was "not by yourself." He emphasized the importance of wide-spread involvement and commitment for the success of the plan. This approach to administrative decision-making is very similar to the one Litchfield (17) proposed.

In 1971, the Carnegie Commission (8) recommended that programs be planned so that varied educational experiences could be provided to people at all stages of life. This could be accomplished by apprenticeship programs, in-service training in industry, and part-time certification programs. Opportunities for higher education should be available to persons throughout their lifetimes and not just immediately after high school.

The Commission suggested that society as well as the individual would gain if work and study were mixed throughout a lifetime. A sense of isolation and of sharply compartmentalized roles is felt by students, workers, young people and elderly people. This feeling could be reduced if more students were workers, more workers were students, and all ages were mixed on the job and in the classroom.

A year after the Carnegie Commission report, Arthur Berchin (3) focused on the costs of various types of instructional modes -- small group, large group, etc. Berchin suggested that the least expensive modes should be considered for use in the community college.

Dewey Allen Adams (1) also analyzed the program planning and course development in 1972. He divided course development into three phases. The first phase, "preparation," includes job description, task analysis, course objectives, criterion examination, target population, course prerequisites, and prerequisite testing. The second phase is called the development phase. It includes outlining, sequencing, content selection, procedures selection, sequence and lesson plan completion, and course tryouts. The third phase, known as the improvement phase, is directed to a comparison of performance with objectives, a comparison of the objectives with the job, and revision and tryout.

In 1973, Kenneth G. Skaggs (20) surveyed many of the factors to be considered in planning new programs. He claimed that a narrow focus in program development can lead two-year college students into dead-end jobs. Many programs are developed through community or state insistence. Students are not trained as well in community college programs as they are in apprenticeship programs. Therefore, Skaggs suggested that programs be re-evaluated continuously because of changing technology. Also, be believed that more field-work experiences should be provided for students.

In a 1973 discussion of decision-making in two-year colleges (13), Edmund Gleazer described the increased role of the state and the legislature in program planning. That role has increased because the colleges have asked for more money from the state and legislature. Gleazer noted, however, that the increase has been resisted by local colleges, boards, and communities.

In 1973, Dean N. Evans and Ross L. Neagley (11) offered a step-by-step approach to the design of a dynamic two-year college program. Their steps are as follows: (a) identification of the needs of the community that can be met by the college; (b) determination of the basic philosophy which will undergird the program; (c) organization of a citizen's committee to advise the college on career programs; (d) establishment of basic learning sequences for the program; and (e) completion of personnel and logistical support plans for the process of instructional development.

Finally, in 1973, David S. Bushnell (7) proposed a strategy for deciding whether or not to implement a new program. This strategy consists of five steps: (a) the problem is diagnosed; (b) the objectives are formulated and criteria established; (c) the constraints and resources are identified; (d) potential solutions to the problem are selected; (e) alternative solutions are evaluated; and (f) action is taken.

Despite an abundance of discussion, there have not been many changes since World War II in the procedures for planning occupational programs. In recent years, administrative decision-making theory has been added to a need-survey approach, but the planning process is still, largely, a hit or miss operation. (Skaggs (20) points out many of the "misses" in community colleges today.) The development of a systematic structure for program planning should change many of those misses into hits. Such a system is sorely needed to improve program planning in two-year colleges today.

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A REVIEW OF THE DEVELOPMENT AND USE OF SYSTEMS IN EDUCATION

The previous chapter traced the development of occupational program planning in two-year colleges. That development was market by attempts to provide systematic coherence to the planning of occupational programs. This chapter discusses concepts which are important in the systematization of educational decisions. The major concept is that of a system, a term which has been used and abused in educational theory.

Systems

The term, "system," has two general and accepted types of use -- a common-sense use and a scientific use. The mix of the common-sense use with the scientific use can cloud the definition of the term.

In the common-sense use, a system recognizes the relationship of parts or attributes to a whole phenomenon. The phenomenon might be specific or general. So might be the parts.

The scientific use of "system" involves cybernetics, the study of systems control. Cybernetics explains aspects of phenomena which cannot be explained by the activities of the individual component elements of those phenomena. Cybernetics stresses the interaction of the elements of phenomena. The essential feature of cybernetics, (the word derives from the Greek word for "governing") is the stress it places on phenomena as total systems.

Two offshoots of cybernetics are general systems theory and systematics. General systems theory reduces all of science to very general principles under which each discipline can be subsumed; general systems theory stresses the unity of science. Systematics has developed because general systems theory disregards important, individual features of disciplines in an effort to find relationships among them. Systematics refers to the assessment of systematic relations among specific fields and disciplines.

The view of phenomena as systems is not new. The history of science shows many uses of a systems analogy to find relationships between phenomena or events. But great attention has been paid to the systems approach recently, partly because of the general advances made in interdisciplinary studies (particularly in the areas of biology, biochemistry, environmental studies and electronics), and partly because of advances in high speed computing. In computing, systems organize data for simulation studies, etc. The design of computer programs is called systems engineering.

Systems have several limitations. The subsuming of data under a systems framework does not endow that data with extra explanatory or predictive power, even though it may clarify the data somewhat. Systems are also limited by their ability to show relationships among phenomena. They represent certain kinds of relationships, the kind being determined by the person who designs the system. For example, a subway system might be represented graphically to show relationships of distance between lines and stations, or it might be designed to show time between stops represented as distances on a graphic scale.

Systems in Education

Systems theory has been used extensively in education. It is more accurate perhaps to say that various parts of education have been analyzed for their systematization. The areas most exposed to a systems view are administration and curriculum. In administration, management, decision-making, planning and counseling can be seen as interactive systems. In curriculum, systems have been developed for planning, implementation and evaluation.

In recent years, Leonard Silvern (7) has been the major contributor to the development of systems approaches to education. In a number of publications Silvern urges a systems engineering approach to all of education and particularly to instruction. He interprets instruction as a dynamic system with feedback from occupations and student performance which permits constant revision.

Gibson (5) has systematized decision-making in schools through a chart of the tension and interaction of value systems and knowledge systems. These two systems feed into a decision system. Within the decision system are several subsystems. A control system flows into an action system. The control system is also regulated by a monitoring system that receives feedback from a particular event system.

Steward and Winborn (8) have developed a general system for decision-making in counseling. Their system contains language that was originally developed by Silvern. The system is an open one with twelve well-developed subsystems. Each major subsystem contains information relevant to decision making, this information itself being part of a minor subsystem. One of the claims made for the system is that it forces the counselor to be systematic, i.e., to adopt uniform procedures that permit the evaluation and modification of practices.

Another system for counseling has been created by H. B. Gelatt. His "Sequential Decision-Making Process" (4) shares Gibson's (5) idea of a value system, which reacts with a prediction system and a criteria system for the evaluation and selection of decisions (these latter systems embody the knowledge system of Gibson). Gelatt depicts two stages of decisions: an investigatory decision that develops methods of investigation and data analysis; and a terminal decision which leads to an outcome.

Stufflebeam's (9) evaluation scheme has Values, Options, and Information (data) feeding into a Decision-maker which determines in turn Choice, Altered action, and Educational improvement. Stufflebeam's system is a rationale, rather than an analysis of the procedure of evaluation.

Another system of note is Marcus's "Organizational Decision Model" (6) which has three stages of refinement. During the first stage, the decision-maker defines an approximate goal or aspiration level and maps certain strategies relevant to its attainment. During stage two, alternative strategies are evaluated and their outcomes determined in a loose way. In stage three the outcomes are compared with the initial aspiration level to achieve what is called an optimal solution, a satisfactory conjunction of outcome and aspiration. If the outcomes exceed the aspirations, the level of aspiration is increased. If they fall short of the aspiration, then the outcome is fed back into stage two to be modified accordingly.

Barbee's A Systems Approach to Community College Education (1) is a work that is important to this project. Unlike the systems noted in the foregoing analysis, Barbee's system incorporates a whole institution, community college. Barbee urges community college educators to adopt a systematic approach to their task by taking into account the inputs which affect the college. The community college, as a system, reacts with other systems outside the college: consumers, the community, government, organizations, other educational systems, supporting technology, and the discipline areas. Within the community college system are the major systems of Instruction, Management, Administrative support and Policy. The chief system is Instruction. These systems receive input from some of the outside systems (e.g., the Instructional System receives input from Supporting Technologies and Educational Institutions). The four major internal systems contain minor systems. The minor systems interact within the major system and contribute input and receive output from other major and minor systems. The minor systems interact within the major system and contribute input and receive output from other major and minor systems. The Instructional system, for example, has the minor systems of Students, Guidance, Curriculum and Instruction. These minor systems contain lesser subsystems.

Barbee's community college system is quite complex but it does show the dynamic nature of the community college and, particularly, the need for precision in determining the results of any actions or decisions made in any small area, i.e., a subsystem. Barbee's model emphasizes the need for specifying very clear objectives, particularly in the Instructional System. Clear objectives enable exact evaluation, the measurement of effectiveness, and the formulation of cost elements.

The decision-making system of Borgen and Davis (2) is intended to be a systems approach to curriculum development and evaluation for occupational education in two-year colleges. This system begins with the specification of outcomes, proceeds to the establishment of objectives from whence the process continues through the ranking of objectives, defining the problem, identifying the problems, developing alternate solutions, establishing criteria (marked "high", "low" or "optimum"), collecting of data, evaluating alternatives, making a decision based on objectives, exploring consequences of the decision, and implementing the decision. From the implementation base there is feedback to a box for evaluation of the decision and the making of necessary changes; this in turn feeds back into the initial establishing of objectives area. This system (essentially a simple flow chart) bears a general appearance to a typical evaluation schema and exhibits a low level of systems interaction.

Relationship to this Project

There are many other systems which could be cited, but the intention of this section has been to discuss the benefits and constraints of systems, and to describe the broad features of typical systems.

This project has developed a planning system which shares features common to most systems, namely the following: the conception of planning as a dynamic process in which information moves through related stages; the conception of information stages having systematic relationships with one another and as part of a larger system; and the conception of processes as being susceptible to a simple representation with an attempt to exhaustively describe the possible inputs.

If any type of system has been influential in the development of this project's System, it would be the type used in evaluation. The main feature of the System is the form in which evaluation-type questions are asked. The inclusion of assessment, judgment, strategy, etc. points to program planning based on the evaluation of alternatives. The network of the precision subsystems is strongly influenced by evaluation procedures in which criteria are determined prior to fact finding. The System might be seen as a large evaluation model of present planning practices. Its intent, however, is to recommend a certain path for program planning based on the assessment by each college of each relevant input.

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PART THREE: A SIMULATION

INTRODUCTION

The following pages contain a simulated program planning exercise. You will be asked to review information from a variety of sources in order to decide whether or not a program in bicycling management and/or technology should be implemented at your college.

The purposes of the simulation are as follows: to provide inexperienced planners with a "feel" for the materials and sources of information in program development; to expand the list of sources that is used by experienced planners; to reveal the interlocking nature of many types of information; and to reveal the hidden "systems" -- the priorities -- of planners that cause them to use particular types of information in particular ways. The simulation does not relate directly to the System. However, a knowledge of the System will help the user of this simulation.

The simulation suffers from some limitations that affect the achievement of its purposes. First, its sources and information are limited in number and amount. The user of the simulation acquires general program planning information instead of concentrated doses of that information. Second, the information includes only external "facts" about a program. It does not include the hopes and biases of the planner. In a real experience, those hopes and biases would be as important as any external "facts". Finally, many of the "facts" have been manufactured for this experience. Some of them are true, but most of them have been manufactured. At the present time, the simulation represents a hypothetical experience in program planning. There is no bicycling technology and/or management program in any two-year college in the country.

The simulation consists of four parts: the review of background information about the program; the selection and review of eight sources of information for the simulation; the selection and review of additional sources; and a response to questions about the simulation.

The simulation is a self-paced exercise. However, some users might want to place some time limits on the exercise. The following are suggested limits for such users:

Time (minutes)	Purpose
15	review of background information and selection of 8 initial sources
10	review of 8 sources
40	selection and review of additional sources (5 minutes per source)
10	completion of response sheet
1 hr. 15 min.	total time of simulation

These time limits are noted parenthetically in each part of the simulation.

Now, review the background information for the simulation and make your selection of eight initial sources of information. (Time: 15 minutes)

BACKGROUND INFORMATION

You are a faculty member at Lothlorien Community College.* Your task is to investigate the establishment of a program in bicycle technology and/or management. At the end of the simulation, you will be asked to report your decisions about the establishment of this program.

The College: Lothlorien is located in a city of 20,000. Its district is situated between two major cities in upstate New York. The college has approximately 2,000 students, split evenly among full-time and part-time, day and evening attendance.

The Concern: You have been aware that a bicycle boom has taken place in the United States. In 1950, the nation had 15 million bicycles; today it has 70 million; in 1980, it will have 100 million bicycles. You know that someone will have to design, sell and repair these machines. You recall a comment in the Small Business Reporter: "For the person who combines the skills of a retailer, a mechanic and a business manager, there's the promise of a high riding future in the bicycle business." Perhaps Lothlorien Community College should educate students for that future.

Preliminary Data:

a) You have learned that three other two-year colleges offer programs in bicycling. Smog Tech in Los Angeles teaches students about the design and technology of bicycles. Peel College in Florida has a shop management program. The University of Wisconsin at Cheese teaches students to design and manage community recreation and bicycling programs. No eastern college offers a bicycling program.

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*In Tolkien's The Lord of the Rings, Lothlorien is the "fairest woods in all the realm." Undoubtedly, this also describes the two-year college at which you work.

b) In a survey of phone books you have discovered the following information about bicycle shops and manufacturers in New York State:

Shops		Manufacturers	
Local	9	Local	1
Buffalo	54	Buffalo	1
Rochester	47	Rochester	
Syracuse	28	Syracuse	1
Albany	18	Albany	
New York	67	New York	35
	223		38

Two manufacturers are in or near your region: the Design Craft Company, a manufacturer of parts, and the Pacer Bicycle Company.

c) Historically, Lothlorien Community College has been open to the expansion of programs. New programs have received the support of students and staff. Resources for programs have grown slim, however, and existing programs have suffered some cutbacks. You believe that the program will attract students because of the association of bicycling with youth.

The Decision: This data helps you to answer the estimation questions in the following tentative way:

Identity---	The program should teach students to understand the technology of bicycling and/or the management of bicycling enterprises.
Articulation---	There should be no problems since there is no competition.
Resources---	Resources might be a problem, but that shouldn't stop the investigation.

Students---	The increase of bike sales and the youth appeal of bicycling indicate a student draw.
Employment---	Two local manufacturers and over 200 shops in the state could hire graduates.
Support---	The other answers indicate that the program will be supported.

Letter of Intent:

These answers to the estimation questions indicate that the program should be investigated further. You submit the following Letter of Intent to Albany:

Vice Chancellor for Academic Programs
S.U.N.Y.
99 Washington Avenue
Albany, New York 12210

Dear Vice Chancellor:

I am submitting the following Letter of Intent in accordance with your memorandum of October 1, 1973, outlining procedures for submission of academic program proposals.

Lothlorien Community College is presently studying the feasibility of establishing a new associate degree career program in bicycle technology and/or management. We are presently looking forward to a September 1975 beginning date.

The graduates of the Bicycle Technology and/or Management Program should be able to pursue any one of a broad range of careers associated with bicycling. After an organized program, graduates might: manage a shop; service or design bicycles; instruct others in riding, service and purchasing techniques; and design or manage community recreation and bicycling programs.

Preliminary studies indicate that this program will fill a need for qualified personnel in the locality, region and throughout the state. Apparently, no other programs of this kind exist in the Northeast.

An ad hoc committee is being organized to investigate the feasibility of the program. We welcome any assistance you can give us.

Sincerely,

President
Lothlorien Community College

The response to the letter is affirmative. Thus, you are faced with the precision question: "Should this program be implemented?" The answer to that question is the specific goal of this simulation.

SOURCES OF INFORMATION

Below is a list of the sources of information for the precision phase of simulation. The list might or might not be comprehensive. The sources might or might not be helpful. In the next few minutes, please select eight *initial* sources for information about the development of your program. You will be able to select *additional* sources throughout the simulation. As you select sources, check them off in the right-hand column.

SOURCE	INFORMATION	PAGE	✓
Local College			
Business Management Staff	support, students	135	
Mechanical Technology Staff	support, resources	141	
Director of Continuing Education	strategy	116	
Admissions and Counseling Staff	students	151	
Director of Research	strategy	143	
Literature			
Newspapers	employment	127	
Bicycling - 4/75	employment	118	
5/75	employment, general	113	
Bicycle Spokesman	employment	156	
Bicycle Test Reports - 1973	employment, general	114	
State Manpower Studies	employment	132	
National Manpower Studies	employment	145	
Business and Trade			
Bicycle Institute of America	employment, resources	117	
Design Craft Company	employment	130	
Pacer Bicycle Company	employment	142	
Local and Regional Shops	students, employment	138	

External Education Agencies

Bureau of Two-Year College Programs	resources	149	____
Regional Planning Council	articulation	131	____
High School - A	students, support	133	____
High School - B	students	126	____
High School - C	students	147	____
BOCES	articulation, resources	119	____
Smog Technology College	identity, resources, general	148	____
Peel College	identity, resources	134	____
University of Wisconsin at Cheese	identity	150	____

Please turn to the appropriate pages and read the information from the eight sources you have selected. After you have read the information, make any notes on the worksheets that are provided. After careful consideration of this information (10 minutes), follow the instructions at the bottom of each source that you have selected.

You might choose to use all of the sources in the simulation or you might decide the program's fate after choosing only eight sources. Choose as many sources as you need. After you have finished reviewing all of the sources which you feel are necessary for your decision, turn to page 157 (40 minutes).

-- STOP --

[Do not go beyond this page until you have selected 8 sources]

WORKSHEETS

LITERATURE

BICYCLING - MAY 1975

(5 minutes)

Listed the following potential employers in their advertisements.

supply houses: general-10; specific-27.

distributors: regional, national-37

salesmen wanted-1

instructors wanted-1

shops available: 2

jobs available:

personnel sales-1

repair-2

bike manufacturers-U.S.-4; others-19

parts manufacturers-U.S.-31; others-8

touring outfits-general-1; bike-8

Shops listed: 7 NY 3 VT
8 NJ 5 MAS
3 PA 3 CONN

[After careful consideration of this information, you may select another source.]

LITERATURE

BICYCLE TEST REPORTS 1973

(5 minutes)

Juvenile bikes: 2 - 5

10 manufacturers

6 - 9

13 manufacturers

10 - 13

25 manufacturers

Adult bikes: 1 + 3 speed

24 manufacturers

10 speed under $100

36 manufacturers

10 speeds $100-$149

61 manufacturers

total 135 models

10 speeds $150-$249

34 manufacturers

10 speed over $250

37 manufacturers

Track Bikes ---- 4
Tandems -------- 8
Adult Trikes --- 6
Folding Bikes -- 15
Exercycles ----- 8

Total 98 different manufacturers of bikes.

[After careful consideration of this information, you may select another source.]

BUREAU OF TWO-YEAR COLLEGES

(5 minutes)

You submit a proposal for VEA funds. The request is for $25,000 to cover equipment and faculty costs for the program. You receive a phone call response from the Bureau which asks the following questions: Have you investigated local financial support thoroughly? Can you cut down costs by an amalgamation with or reduction of existing courses? You say that you will consider the questions carefully.

/After careful consideration of these questions, turn to page 144./

LOCAL COLLEGE

DIRECTOR OF CONTINUING EDUCATION

(5 minutes)

The director of continuing education believes that a full program in bicycling should probably not be offered at this time. She believes that the main appeal of the courses will be to amateurs who want to know more about their bicycles but do not want to become employed in the field. She thinks that one or two courses should be tried in the evening, "to test the program's appeal", then a decision about a full program could be made. She reminds you that several other programs at the college have been developed in this manner.

/After careful consideration of the director's opinions, you may select another source./

BUSINESS AND TRADE

BICYCLE INSTITUTE OF AMERICA

(5 minutes)

(The BIA might be called the Chamber of Commerce of bicycling). In a response to your letter, the chairman of the BIA applauds your intention to set up a "sorely-needed" program. He states that the program will boost the quality of the bicycling industry as a whole. This letter contains two other points of interest. First, he believes that the next five years will witness a change in the nature of bicycle shops. Many new shops will close and older shops will expand. Customers will want to buy parts rather than new bicycles. They will also want to take their service problems to established dealers whose presence in the community is assured. As a result, the late arrival, fly-by-night shops will be in trouble. The chairman's second point is that the BIA might be willing to donate $500 for the establishment of the program.

[In 5 minutes you will receive a letter; turn to page 124 to open it.]

LITERATURE

BICYCLING - APRIL 1975

(5 minutes)

1974 sales of bicycles = 14,150,000
1973 sales of bicycles = 15,300,000

Sales estimate for 1975 is 13.8 million, down from an earlier estimate of 16 million. The drop affects low and middle priced bikes more than high-priced bikes.

In 1974, 72 per cent of all bikes sold were made in the U.S. (10,161,000). 3,979,000 imported bicycles were sold, 1.3 million less than in 1973.

[After careful consideration of this information, you may select another source.]

EXTERNAL EDUCATION AGENCIES

BOCES

(5 minutes)

The BOCES director indicates by phone that he has considered offering some introductory bicycling courses at the BOCES. He believes that the preparation of shop personnel is below college level. However, he would be willing to talk further with you. He already has offered one course on bicycle repair and he has approximately $7,000 worth of equipment available in his labs. If arrangements could be worked out, the students in the college program might be able to use that equipment in the BOCES facilities. The director also wants to know if BOCES students would have to repeat the introductory courses at the college level.

[After careful consideration of this information, you may select another source.]

DEAN OF INSTRUCTION

(5 minutes)

The Dean of Instruction calls you. He says that he has received a phone call from the director of mechanical technology about your proposed program. The director has voiced opposition to the establishment of a separate program in bicycling. He has raised the following points: The program will be a technology program if it follows the Los Angeles model; its costs could be reduced significantly if present mechanical technology equipment and instructors are used; students might be drawn from existing courses in mechanical technology into similar courses in a different department. The Dean asks that you talk with the mechanical technology director about these concerns.

[After careful consideration of the Dean's concerns, you may select another source.]

LOCAL AND REGIONAL CLUBS

ENROLLMENT SURVEY

(10 minutes)

	Local	Regional
Number of clubs	1	5
Number of members	15	200
Member Interest in Attending Program		
Full-time		
very interested	2	5
somewhat interested	1	11
not interested	12	168
Part-time		
very interested	4	16
somewhat interested	-	18
not interested	-	150

/Turn to the next page./

LOCAL AND REGIONAL CLUBS

EMPLOYMENT SURVEY

You survey the local and regional clubs to find out what percentage of the available jobs might be taken by people who are interested in bicycling but who might not be employed in the field. You assume that the bicycle clubs attract people with some skills who are deeply interested in bicycling. Your survey reveals the following information:

		Number of responses	
		Local	Regional
A. Estimation of skills			
General Knowledge	- a lot	10	100
	some	4	54
	little	3	36
Repair and service	- a lot	6	60
	some	8	110
	little	3	30
Technique - touring, Racing	- a lot	3	32
	some	8	89
	little	4	79

	Local		Regional	
	FT	PT	FT	PT
B. Present Employment:				
Bicycling:				
Shops	2	4	14	12
Manufacturers			11	
Other				
Non-bicycling	7		80	12
Unemployed:				
seeking work			3	
ineligible for employment		2	68	

/Turn to the next page./

C. Future Employment Interests in Bicycling:

		Local		Regional	
		FT	PT	FT	PT
1976	Shops			4	3
	Manufacturers	1		6	
	Other				
1977	Shops			2	6
	Manufacturers	1		10	
	Other			1	
1978	Shops	1		3	
	Manufacturers			5	
	Other				
1979	Shops				
	Manufacturers				
	Other				

Reasons for Entry or Departure

Entry:

"Retirement, want part-time money"
"Love the field but a student now"

Departure:
"Low salary"
"Find employment in my profession"

/After careful consideration of this information, you may select another source./

BICYCLE INSTITUTE OF AMERICA

(5 minutes)

You receive a check for $500 in the mail and a copy of a public relations release from the BIA. The release reads:

> BIA Funds Community College Program
>
> As part of its continuing efforts to advance the bicycle industry, the Bicycle Institute of America has awarded a grant to Lothlorien Community College for the establishment of a new program in bicycle shop management. The Chairman of the BIA, Arnold Jones, has stated, "Lothlorien is to be congratulated for its commitment to the improvement of the bicycling industry. The preparation of qualified shop managers is sorely needed in our industry today."

A note from Mr. Jones asks for your prompt approval of the release for publication in local and national media.

/After careful consideration of this information, you say select another source./

Bicycle Management and Recreation
University Extension Center at Cheese
Wisconsin

(5 minutes)

Program Description: This program enables students to become recreation supervisors with an emphasis on bicycle management and instruction. Graduates have found work with local and state recreation agencies; environmental protection groups; bicycle magazine publishers and professional tour agencies.

Course No. and Title		Credits
First Semester		
ER 100	Health	3
ENG 101	Composition	3
HPER 107	Basic Bicycling	3
PSYC 101	Psychology	3
HIST 101 or 121	History	3
Second Semester		
ENG 102	Composition	3
HPER 204	Intro. to Recreation	3
SOC 101	Sociology	3
HPER 108	Bike Repair	3
HIST 102 or 122	History	3
Third Semester		
HPER 212	Bikecology	3
HPER 205	Recreational Supervision	3
BIO 101	Biology I	4
ENG X	Literature	3
HPER 105	First Aid	2
Fourth Semester		
HPER 213	Bicycling Organizations and Action Groups	2
BIO 102	Biology II	4
HPER 210	Bikepacking	2
X X X	Electives	6
Eng X	Literature	3

[Turn to the next page.]

Course Descriptions

HPER 107 Basic Bicycling 3

Students are taught the following: bicycle history; how to buy a bicycle, how to ride; biking your way to health; touring and racing fundamentals.

HPER 108 Bike Repair 3

Students learn to disassemble, repair and reassemble parts of one, three, five and ten speed bicycles.

HPER 210 Bikepacking 2

The course is divided into three parts: a discussion of equipment and techniques; planning for an extended bike tour; and a two week tour on the Cross-Wisconsin Bikeway.

HPER 212 Bikecology 3

The bicycle is seen as a means to personal and environmental health. Students plan an aeorobics and meditation program for themselves and a bikeways program for the community.

HPER 213 Bicycle Organizations and Action Groups 2

The historical development and political importance of bicycle organizations are discussed. Students work with representatives of local bicycle clubs, lobby organizations and the legislature.

[After careful consideration of this information, you may select another source.]

LITERATURE

NEWSPAPERS

(5 minutes)

During the past two weeks, the nearest big-city newswaper has advertised three positions in bicycle shops. All three are sales and service positions, requiring experience in all areas of repair except for frame reconstruction. Salary range is from $7000-$10000 for qualified individuals.

/After careful consideration of this information, you may select another source./

EXTERNAL EDUCATION AGENCIES

HIGH SCHOOL B

(5 minutes)

Counselors: "We estimate that two or three of our students would enroll in this program. As you know, we send about one hundred graduates to LCC and we have no idea about what they enroll in."

Teachers: "We don't know if the field needs two-year college people. Our tech students should handle these jobs. Besides, what's so difficult about fixing bicycles?"

/After careful consideration of this information, you may select another source./

HAROLD R. SMITH

(5 minutes)

You receive a phone call from Harold R. Smith, a retired engineer for Design Craft. Mr. Smith has heard about the program from the personnel manager at Design Craft. He wants to talk with you about the possibility of his teaching in the program. He cites some of his accomplishments in the areas of stress analysis and wind resistance testing. He believes that he can "bring quality and experience to a program that prepares future engineers". He has outlined a couple of courses that he would like to teach: Stress and Fatigue in Materials and Construction; and Advanced Design Concepts. He wants to set up an interview with you in the near future.

[In 5 minutes your phone will ring again. Turn to page 152 to answer it.]

BUSINESS AND TRADE

DESIGN CRAFT COMPANY

(5 minutes)

Design Craft has been manufacturing parts for bicycles for the past twenty years. Lately, it has been marketing such innovative parts as: sealed bearing hubs and bottom brackets, titanium-manganese freewheels, and lightweight seat posts. The personnel manager cites hiring figures for the company for the past three years:

	73	74	75
top managers	1	-	2
*second line managers	4	1	5
designers-engineers	3	3	3
*technicians - quality control, etc.	4	4	5
*salesmen	2	3	3

He stars the areas that have been marked by the growth of jobs instead of the replacement of personnel. He talks about the company's history in and commitment to the design and manufacture of new parts. He believes that a meeting might be set up between you and personnel from the company

/After careful consideration of this information, turn to page 129./

EXTERNAL EDUCATION AGENCIES

REGIONAL PLANNING COUNCIL

(5 minutes)

Although they are concerned that the program will be located outside of a major city, the Council knows of no competitive programs. They recommend, however, that you see how your introductory courses articulate with several continuing education courses that are offered by high schools and a university in the region.

[After careful consideration of this information, you may select another source.]

LITERATURE

STATE MANPOWER STUDIES

(5 minutes)

New York State Comprehensive Manpower Plan - 1974

No information is available, but cross checking with motorcycle mechanics reveals "rapid growth" for employment.

[After careful consideration of this information, you may select another source.]

EXTERNAL EDUCATION AGENCIES

HIGH SCHOOL A

(5 minutes)

Counselors: "From a survey of 100 students who expect to attend LCC, nine have expressed an interest in this program. As you know, many of our students change their minds between now and September, so you might attract three of our students. Oh, by the way, how is Randy Eberle doing up at LCC? He was a fine student here."

Teachers: "It sounds like a great idea. Keep me informed about the program and I'll talk it up in my courses. I'd like to take the introductory course [illegible]

/After careful consideration of this information, you may select another source./

EXTERNAL EDUCATION AGENCIES

PEEL COLLEGE

(5 minutes)

Peel College offers a program for bicycle shop managers in the greater Miami area. Twenty of the program's thirty graduates are so employed; the remainder work for regional and national firms. The program cost $20,000 to establish, including one new faculty member and equipment. Money for the program came from the deletion of a struggling program. Some services and equipment are shared with the business division. If you would like a copy of the program outline, please don't hesitate to ask.

[If you decide to ask for an outline, turn to page 154.]

LOCAL COLLEGE

BUSINESS MANAGEMENT STAFF

(5 minutes)

The chairwoman of the business division has contacted you about the proposed program. She believes that the program might be appropriate as an option under the business management program "because of all the business courses that are needed." She cites the program at Peel College as an example of a bicycling program that should be offered by the business division. "Besides", she states, "students will be eligible for more jobs if they have a business degree and not a bicycling degree". She want you to keep in touch with her, because of the potential loss or gain of students in business courses if the program is approved.

/After careful consideration of this information, you may select another source./

Bicycle Technology Program
Smog Technology College
California

(5 minutes)

Program Description: In the United States today, bicycling is a rapidly expanding form of transportation. By 1980, 100 million bicycles are expected to be in use in the nation. The purpose of this program is to train technicians who can repair, design and build bicycles and parts to meet the needs of today and tomorrow. Recent graduates have been employed by such companies as: Shimano-USA; Schwinn; Dobi Company; Maeda Industries; and Phil Woods. They have been employed as service advisers and technicians for local manufacturing, supply and retail firms.

Course No. and Title		Credits
First Semester		
BIC 101	Introductory Bicycling	3
ENG 101	Composition	3
PHY 111	Applied Physics I	4
MET 110	Drafting	3
MAT 105	Tech Math I	3
Second Semester		
SPH 101	Speech	4
MET 104	Manufacturing Processes	2
PHY 112	Applied Physics II	4
BIC 102	Bicycle Service	3
MAT 106	Tech Math II	3

[Turn to the next page.]

Third Semester		
BIC 201	Engineering & Design	3
MET 114	Value Engineering	3
X X X	Soc. Sci. Elective	3
MET 108	Mechanics	3
MET 204	Engineering Materials	2

Fourth Semester		
MET 205	Stress Analysis	3
X X X	Soc. Sci. Elective	3
BIC 202	Engineering & Design	3
X X X	Electives	6

Course Descriptions

BIC 101 Introductory Bicycling 3

Students learn the basic principles of bicycle: construction; riding techniques; purchasing; health and safety; and racing and touring.

BIC 102 Bicycle Service 3

Students learn to repair different models of the following: hubs, cranks, pedals, freewheels, brakes, headsets, gear shifters and depilleurs. Frame brazing and wheel assembly are taught.

BIC 201 Engineering & Design I 3

Students are introduced to bicycle engineering. Materials, methods of construction and design concepts are discussed.

BIC 202 Engineering & Design II 3

Students construct a bicycle of their own design.

/After careful consideration of this information, you may select another source./

BUSINESS AND TRADE

LOCAL AND REGIONAL SHOPS

(10 minutes)

				Local FT/PT	Regional FT/PT
I	Number of shops			9	75
	Number of shops responding			9	30
II	Personnel employed				
		Managers		9/2	30/4
		Service		5/6	40/20
		Sales		6	10/18
III	A.	Interest in Attending Program			
		Managers:	very	1	2
			somewhat	2	7
			not	6	20
		Service:	very	1	4
			somewhat	3	7
			not	4	18
		Sales:	very	-	3
			somewhat	1	4
			not	-	10
	B.	Reasons for Lack of Interest			
		"Distance from college" "Scheduling is a problem" "Already a college graduate"			
IV	A.	Expect to hire managers (include sale of shop)	- 1976	2	2
			- 1977	1/3	4/6
			- 1978	2/4	6/8
			- 1979	2/5	9/10
		" " " service:	- 1976	2/4	16/12
			- 1977	4/0	16/19
			- 1978	-/3	10/12
			- 1979	4/6	12/18
		" " " sales	- 1976	2	3/6
			- 1977	1/3	5/9
			- 1978	1/4	5/12
			- 1979	2/5	9/15

/Turn to the next page./

B. Willingness to employ graduates in preference to others:

Very willing	2	7
Somewhat	3	15
Not willing	4	8

C. Reasons for willingness/non-willingness to employ graduates:

Willingness:

"better training than our shop can do"
"will be able to do diverse tasks"
"need an infusion of new skills around here"

Non-willingness:
"over-trained for our needs"
"I fear that their salary demands will be too high"

[After careful consideration of this information, you may select another source.]

VERMILIA D. PACER

(10 minutes)

Two weeks after you contacted the Pacer Bicycle Company, you receive a call from the lawyer for Vermilia D. Pacer, the widow of Cyrus Pacer, founder of Pacer Industries. The lawyer states that Mrs. Pacer has learned of the potential program and might be willing to make a "substantial donation" for its establishment. You agree to talk with Mrs. Pacer about the program.

[Other commitments delay the meeting. After 10 minutes, turn to page 146.]

LOCAL COLLEGE

MECHANICAL TECHNOLOGY STAFF

(5 minutes)

The head of the mechanical technology program believes that the new program should be an option under mechanical technology. He cites the program at Smog Tech as an example of a program that is "actually a mechanical technology program". He contends that the mechanical technology program already has the basic staff and equipment to educate students. All that would be required is " a new staff member and $5000 of materials. Otherwise the costs might be as high as $50,000 for equipment." He would like to talk with you further about his concerns, "because of the parallel between your program and mine".

/Your phone is ringing. Turn to page 120 to answer it./

BUSINESS AND TRADE

PACER BICYCLE COMPANY

(5 minutes)

Pacer Company is the nearest manufactorer of bicycles to your college. It is located approximately 20 miles from the college. The personnel manager at Pacer reports that sales have been off this year and some assembly people have been laid off. If this setback continues, then some designers and second level managers will be laid off. He remarks that these cutbacks contrast sharply with the growth of the company over the last five years. Pacer has trebled its size since 1970. He blames the recession for the cutbacks and believes that the company might start to grow again in the next six months.

[After careful consideration of this information, turn to page 140.]

LOCAL COLLEGE
DIRECTOR OF RESEARCH
(5 minutes)

The director of research, an avid bicyclist himself, offers to help with the design of your survey instruments. He also suggests that you survey local and regional bicycle clubs to assess the possible enrollment and/or employment interests of their numbers.

/_If you decide to work with the director, turn to page 121._7

BUREAU OF TWO-YEAR COLLEGES

(5 minutes)

You receive a $7,500 grant to cover equipment costs for the program.

[After careful consideration of this information, you may select another source.]

LITERATURE

NATIONAL MANPOWER STUDIES

(5 minutes)

Occupational Outlook Handbook - 1972-73

no information

In cross checking employment opportunities in motorcycle mechanics, you saw a prediction of rapid growth. Throughout the 1970's, a few hundred new job openings should be available each year. Other information about this field indicates that it might, in fact, provide comparable information for bicycle mechanics.

Tomorrow's Manpower Needs - 1969

no information

Occupational Manpower and Training Needs

no information

/After careful consideration of this information, you may select another source./

VERMILIA D. PACER

(5 minutes)

At the meeting with Mrs. Pacer, you learn that she will give $15,000 to the program if the following conditions are met: (1) the program is named for her husband; (2) it is dedicated to the Pacer Principle, "Leadership by Design". Thus, it must be dedicated to the preparation of bicycle designers and engineers; (3) the program is open only to the highest ability students as measured by competetive entrance examinations. Mrs. Pacer says that she will add additional scholarship money if necessary to ensure the fulfillment of the third condition. Also, she "will see to it" that the top graduates are hired by the Pacer Company. You thank her for the offer and say that you will consider it carefully.

/After careful consideration of this information, you may select another source./

EXTERNAL EDUCATION AGENCIES

HIGH SCHOOL C

(5 minutes)

Counselors: "Although only 18 per cent of our students go on to college, this type of program might attract quite a few. Despite the fact that the bicycle has always been a middle class toy, a lot of our kids have bikes and are interested in their upkeep. Too bad they can't bring them to school because they'll get ripped off."

Teachers: "If you want our kids to enroll, then you're going to have to find some way to get them back and forth from their homes. Also, our students will not enroll if you load them down with a lot of abstract stuff. If you start with their hands, their heads will follow."

[After careful consideration of this information, you may select another source.]

EXTERNAL EDUCATION AGENCIES

SMOG TECHNOLOGY COLLEGE

(5 minutes)

A call is placed to Smog Technology College, the home of a two-year program in bicycle technology. You speak to the director of the program. The director says that the program prepares technicians and designers for bicycle industries. The program produces twenty graduates each year, who find employment locally and nationally. The program cost about $50,000 initially for capital equipment and $32,000 for new faculty. It has no problem attracting students, including Mexican-American youth. If you want further information, he will be pleased to send you a course outline for the program.

[You decide to ask for further information, but the mail is delayed. Wait five minutes and then turn to page 136.]

EXTERNAL EDUCATION AGENCIES

BUREAU OF TWO-YEAR COLLEGES

(5 minutes)

You contact the Bureau of Two-Year College Programs of the State Education Department about a possible grant of VEA funds for the establishment of the program. You receive word that a proposal must be written. You also learn that VEA grants for equipment have decreased during the past five years.

[If you still decide to submit a proposal, turn to page 115.]

EXTERNAL EDUCATION AGENCIES

UNIVERSITY OF WISCONSIN, CHEESE

(5 minutes)

The director of the Cheese program has no information about the establishment of the program. She arrived on the job last month and her "desk is a shambles". However, she will be pleased to send you an outline of the program if you would like one.

[If you would like an outline of the program, turn to page 123.]

LOCAL COLLEGE
ADMISSIONS AND COUNSELING STAFF
(5 minutes)

Admissions - The director states that new students are more career oriented than in the past. Fifty percent are now enrolled in career programs. However, full-time day enrollment is down while part-time enrollment includes 60 percent of all students. He is unsure whether you should focus on younger or older students, on initial or continuing education.

Counselors - The counselors believe that the program will attract a diversity of students: young, career-oriented students and older, leisure-oriented students. They predict a large enrollment in introductory courses with, perhaps, a falling off in advanced courses. One counselor suggests that this program might attract older people who are looking for part-time or full-time work. She suggests a survey of the potential enrollment of these people.

/After careful consideration of this information, turn to page 153./

RAYMOND SCHWARZ

(5 minutes)

You get a phone call from Mr. Raymond Schwarz of Design Craft. He has heard about the proposed program from the personnel manager. He believes that the company might be able to set up a cooperative education program with the college. Design Craft might accommodate two or three students each semester in various departments of the company. He would like to know what you plan to teach the students and whether or not you have any interest in this offer.

/After careful consideration of this information, you may select another source./

AMERICAN ASSOCIATION OF RETIRED PERSONS

(5 minutes)

A list of AARP members in the area was obtained. It was assumed that this list would include many active older citizens who might be interested in the program and/or in part-time or full-time work in this field. A survey of the members was conducted with the following results:

Number surveyed	120
Number responding	80

Interest in attending

1.	a)	Full-time	0
	b)	Part-time	12
2.	a)	Introductory courses	12
	b)	Advanced courses	4
3.	a)	Professional courses only	5
	b)	Other courses as well	7

Interest in employment

a)	Full-time	1
b)	Part-time	4

Nature of desired employment

a)	Sales	1
b)	Service	2
c)	Management	2

/After careful consideration of this information, you may select another source./

Bicycle Shop Management Program
Peel College
Florida

Recommended Course Sequence

Course No. and Title		Credits
First Semester		
ENG 101	Composition	3
BIC 101	Introduction to Bicycling	3
ACC 101	Principles of Accounting	3
BUS 108	Intro to Business	3
BUS 111	Bus. Math	3
Second Semester		
ENG 102	Composition	3
BIC 102	Maintenance & Repair	3
ACC 102	Principles of Accounting	3
BUS 213	Principles of Retailing	3
BUS 230	Business Communications	3
Third Semester		
BIC 201	Advanced Bicycling	3
BUS 214	Principles of Sales	3
BUS 210	Business Law I	3
X X X*	Soc. Sci. Elective	3
X X X*	Science Elective	4

*recommend psychology, economics, sociology.

Fourth Semester		
BIC 202	Shop Management	3
X X X	Elective	3
BUS 211	Business Law II	3
X X X	Soc. Sci. Elective	3
X X X	Science Elective	4

/Turn to the next page./

Course Descriptions

BIC 101 Introduction to Bicycling 3

The student is introduced to the world of bicycling. The history and lore of bicycling is discussed. Bicycle characteristics, riding techniques, and simple repairs are taught.

BIC 102 Maintenance & Repair 3

Advanced repairs are taught for one, three, five and ten speed bicycles. Included are: freewheel, hub, bottom bracket and headset overhaul; wheel lacing and truing; frame and fork straightening. Students will disassemble and reassemble a three speed and a ten speed bicycle.

BIC 201 Advanced Bicycling 3

The bicycle's relationship to personal health and ecology is taught. Racing and touring techniques are introduced. Each student plans and executes a three day bike trip.

BIC 202 Shop Management 3

The problems of establishing and running a bicycle shop are discussed. Students will plan, set up and operate a model shop. Field trips are conducted to manufacturing plants and established shops.

Program Statement

The purpose of the Bicycle Shop Management Program is to educate the present or potential shop owner who is capable of serving an increasing need within his community. Through an organized sequence of experiences, behavioral development is elicited to permit graduates of the program to function in this capacity.

Graduates have found placement as managers and owners of bicycle shops; representatives for bicycle manufacturers; and as salesmen and executives for distributing houses and parts manufacturers.

/After careful consideration of this information, you may select another source./

LITERATURE

BICYCLE SPOKESMAN

(5 minutes)

The magazine listed the following potential employers in their advertisements:

- Supply Houses
  - general - 2
  - specific - 2
- National and Regional Distributors - 11
- Manufacturers
  - bikes
    - U.S. - 2
    - other - 4
  - parts
    - U.S. - 8
    - other - 3
- Shops
  - Vermont 6
  - Pennsylvania 13
  - New York 10
  - New Jersey 4
  - Massachusetts 12
  - Connecticut 4

[After careful consideration of this information, you may select another source.]

SIMULATION RESPONSE SHEET

(10 minutes)

1. What did you decide about the implementation of this program?

____

____

____

2. What information:

   a) was most important in the making of your decision? __________

   ____

   b) was least important? ____

   c) would have helped if you had it? (Review unused sources of information) ________________________________

3. In what order did you investigate the information in the precision phase?

   identity _____

   articulation _____

   resources _____

   students _____

   employment _____

   support _____

   evaluation _____

4. Was your knowledge of the System helpful in your deliberations about this program? _________ If so, how? __________________________

____

____

5. How might the System have been more helpful? __________________

____

____

CONCLUSION

The user might want to compare his or her precision decisions with the decisions of other users. In the pilot use of the simulation, groups of two-year college staff members made the following decisions about the program:

a) To implement the program as an option under mechanical technology, with electives in business management. This group thought that the supply of students and jobs justified the establishment of the program. They began with the identity subsystem and then worked through, in order, students, employment, resources and articulation.

b) To adopt an open front approach to the establishment of the program. This group decided to establish two courses during the regular semester: Introduction to Bicycling and Bicycle Maintenance. The success of these courses would dictate the future of the program. The group started with students and worked through, in order, employment, support, articulation, identity and resources.

c) To establish a complete and independent program in bicycle technology and management. This group, from a residential college, expected to attract students from throughout the state. They believed that adequate revenue could be gathered to justify the independent establishment of the program, but they would also use existing business and mechanical technology faculty when possible.

d) Not to establish any program in bicycling. This group did not believe that a program was justified. However, they recommended the establishment of two evening courses in bicycling. The group believed that the University of Wisconsin program was, potentially, the most desirable two-year program. They based their decisions on the support and identity subsystems.

Four groups, four decisions -- basically the same information! The program process can go in different directions toward different conclusions. None of the decisions of the four groups is necessarily correct. None is necessarily wrong.

At this time, the user of the simulation might be dissatisfied with his or her results. The user might complain that more time, energy or information is needed to make a proper decision about the bicycling program. That is correct. But instead of the ideal, this simulation has reflected the real process of program planning: too little time, too little solid information. The process will never be perfect. Hopefully, however, the readers of this document and users of this simulation will be able to improve the program planning process in which they take part. That improvement has been the reason for this document.

UNIVERSITY OF CALIF.
LOS ANGELES

OCT 31 1975

CLEARINGHOUSE FOR
JUNIOR COLLEGES